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Internal information on AGRICULTURE

Projection of production and consumption of agricultural products - "1977"

II. Denmark, Ireland

COMMISSION OF THE EUROPEAN COMMUNITIES
DIRECTORATE-GENERAL FOR AGRICULTURE
DIRECTORATE FOR "AGRICULTURAL ECONOMICS AND STRUCTURE" – DIVISION FOR "BALANCE-SHEETS, STUDIES, INFORMATION"

APERÇU DES PRINCIPAUX ÉLÉMENTS DE L'ÉTUDE

PROJECTIONS DE LA PRODUCTION ET DE LA CONSOMMATION DE PRODUITS AGRICOLES - "1977"

I. ROYAUME-UNI

II. DANEMARK, IRLANDE

Série : "Informations Internes sur l'Agriculture" N°s 108 et 109

Cette étude vient de paraître en langue allemande.
Les versions française et anglaise sont en préparation.

Dans le cadre de son programme d'études, la Direction Générale de l'Agriculture a confié à des experts indépendants l'élaboration de projections des différents éléments constitutifs de la production et de la consommation des principaux produits agricoles dans chacun des Etats membres et cela suivant différentes hypothèses de base et compte tenu, dans la mesure du possible, des évolutions structurelles.

Le volume n° 108 contient les résultats des travaux pour le Royaume-Uni et le n° 109 ceux pour le Danemark et l'Irlande.

Les travaux, pour lesquels l'horizon 1977/78 a été retenu, portent sur les principaux produits agricoles, y compris les consommations intermédiaires, les bilans globaux de consommation alimentaire humaine et animale et sur les éléments des comptes globaux de l'agriculture.

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COMMISSION DES COMMUNAUTÉS EUROPÉENNES
DIRECTION GÉNÉRALE DE L'AGRICULTURE
DIRECTION : ÉCONOMIE ET STRUCTURE AGRICOLES – DIVISION : BILANS, ÉTUDES, INFORMATION
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Pour les nouveaux Etats membres, vu que leur adhésion entraînait, notamment pour leur agriculture, des changements très importants dont toutes les incidences ne sont pas toujours faciles à évaluer, certaines hypothèses de travail particulières ont dû être retenues.

Les volumes contiennent l'analyse de la demande intérieure ainsi que de l'offre des principaux produits agricoles tels que céréales, betteraves sucrières et sucre, pommes de terre, graines oléagineuses, lait et produits laitiers, oeufs, viandes ainsi que pommes, pêches et tomates.

Les différentes méthodes utilisées dans l'analyse de la demande et de l'offre, les prévisions en matières de consommation alimentaire globale et par tête, de production, de revenus et de prix, sont également exposées dans ces volumes.

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Foreword

This study, the purpose of which is to make possible a forecast of the production and consumption of agricultural products in the United Kingdom, Ireland and Denmark, was produced as part of the programme of studies of the Directorate-General for Agriculture of the European Communities by the

Kiel Institute of World Economics

Coordination of all the contributions was carried out by Dr Martin HOFFMEYER.

The work was carried out :

- for the United Kingdom and Ireland, by Dr. Rainer SCHMIDT;
- for Denmark, by Dr Torsten TEWES.

Two divisions of the Directorate-General for Agriculture also took part; these were : "Statistics, Balance sheets, General Studies" and "Agricultural Prices and Incomes Policy and General Economic Questions affecting Agriculture". This volume contains the report relating to Denmark and Ireland. The report for the United Kingdom constitutes Number 108 in this same series.

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This work does not necessarily reflect the opinion of the Commission of the European Communities and does not anticipate its future attitude in this field.

Introduction

The aim of these studies is a projection of the production and consumption of agricultural products in the three new Member States, the United Kingdom, Denmark and Ireland, in the 1977/78 farm year, assuming that these States adopt the present Community agricultural system and prices immediately upon accession or during a 5-year transitional period. This implies drastic changes, in some cases, in the former national market support systems, in the position of the producers' organizations and, above all, in agricultural prices, which will rise extremely sharply in these countries. There will also probably be considerable changes in some parts of the agricultural price structures of the new Member States. The main problem involved in making a forecast is therefore to predict what will happen if there is a structural revolution in the most important frameworks of the agricultural system (market support arrangements, etc.) and in the time series for prices. Under these circumstances there is a danger that prediction of demand, and more especially of supply, using simple trend extrapolations would produce no meaningful results. Attempts have therefore been made to obtain as much information as possible, in particular regarding the sensitivity of production and consumption to price changes, by using detailed econometric models. These estimated equations applicable to the framework conditions prevailing in the past were then adapted to the new conditions in the light of considerations pertinent to the subject. In addition, appropriate modifications were made to price elasticities in cases of abnormally large price jumps.

In order to be able to predict production and consumption, hypotheses must be made concerning agricultural prices in the enlarged Community in the 1977/78 farm year (see Table 1). In view of the continued high rates of inflation to be expected in the Member States, these price hypotheses imply only a fairly small increase in producer prices. These hypotheses are based on the fact that,

even in the enlarged Community, there is still a danger that structural surpluses will continue to increase on the markets for some key agricultural products, above all those for milk and wheat, unless a relatively restrictive prices policy is introduced. Quite a large increase in producer prices in comparison with other products was forecast only for beef and veal, and mutton and lamb, as even the enlarged European Community is likely to continue to be a deficit area for these products.

A special explanation is necessary concerning the hypothesis on the prices of mutton and lamb. We have assumed that, after the accession of the United Kingdom, Ireland and Denmark, a start will have been made on the common organization of the market in mutton and lamb, whereby account should be taken in particular of the great importance of sheepfarming to the agriculture of United Kingdom and Ireland compared to the other States of the European Community. If it is further assumed that a common market in mutton and lamb would be set up on the same basis as that in beef and veal, the only question still to be answered is how high the price could be in relation to the prices of beef and veal. In our opinion, the most important price for mutton and lamb within the Community of the Six is the one at which the French Government permits imports. This price, which corresponds to the wholesale price for mutton and lamb on the Paris market, stood at approximately £ 353 per 1 000 kg live weight in mid-1972. The average prices for top quality mutton on the Paris market in 1968/70 were approximately 120 % of the beef and veal prices (hind quarters, top quality)[1]. However, even compared to world market prices for mutton and for beef, this ratio seems to us to be rather an exception than the rule. The average producer price ratio in France in 1968/70 was (lamb : veal) 0.91

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[1] See "Agricultural Statistics", Brussels 1970, No 4, p. 100, issued by the Statistical Office of the European Communities.

Tableau 1 - Hypothèses relatives aux prix des principaux produits agricoles dans la Communauté élargie pendant la campagne 1977/78

Produit	- Nature du produit	Unité	1972/73	1977/78	Variations en % entre 1972/73 et 1977/78	Taux annuel moyen d'augmentation entre 1972/73 et 1977/78, exprimé en %
Froment tendre	- Prix d'intervention de base (République fédérale d'Allemagne)	Unité de compte/t UC/t	104,75[b]	116,00	+ 10,7	+ 2,1
Orge	- Prix d'intervention de base (République fédérale d'Allemagne)	UC/t	95,70[b]	107,00	+ 11,8	+ 2,3
Maïs	- Prix d'intervention (France)	UC/t	(83,25)[b]	107,00	.	.
Avoine	- Prix du marché	UC/t	(80,60)[c]	100,00	.	.
Betteraves sucrières	- Prix minimum[a]	UC/t	17,68	19,00	+ 7,5	+ 1,5
Sucre blanc	- Prix d'intervention	UC/t	233,40	247,00	+ 5,8	+ 1,1
Pommes de terre de table	- prix du marché[d]	UC/t	.	45,00	.	.
Colza	- Prix d'intervention de base	UC/t	202,50	223,00	+ 10,1	+ 1,9
Lait	- Prix indicatif franco laiterie (3,7 % de matières grasses)	UC/t	117,70	135,00	+ 14,7	+ 2,8
Beurre	- Prix d'intervention	UC/t	1860,0 [e]	2000,0	+ 7,5	+ 1,5
	- Prix de seuil	UC/t	2011,5	2200,0	+ 9,4	+ 1,8
Lait écrémé en poudre	- Prix d'intervention	UC/t	540,0	700,0	+ 29,6	+ 5,3
	- Prix de seuil	UC/t	670,0	840,0	+ 25,4	+ 4,6
Lait entier en poudre	- Prix de seuil - (26 % de matières grasses)	UC/t	1167,0	1308,0	+ 12,1	+ 2,3
Lait condensé non sucré	- Prix de seuil	UC/t	494,5	555,0	+ 12,2	+ 2,3
Lait condensé sucré	- Prix de seuil	UC/t	661,0	744,0	+ 12,6	+ 2,4
Fromage de Cheddar	- Prix de seuil	UC/t	1560,5	1783,0	+14,3	+ 2,7
Viande de boeuf	- Prix d'orientation	UC/t (poids vif)	780,0 [e]	945,0	+ 21,2	+ 3,9
Viande de mouton	- Prix d'orientation	UC/t (poids vif)	710,0 [f]	860,0 [f]	+ 21,2	+ 3,9
Viande de porc	- Prix de base	UC/t (poids à l'abattage)	825,0	908,0	+ 10,1	+ 1,9
Viande de volaille	- Prix d'écluse[g]	UC/kg poids à l'abattage[h]	0,6913	0,7960	+ 15,1	+ 2,9
Oeufs	- Prix d'écluse[i]	UC/disaine[h]	0,2706	0,3150	+ 16,4	+ 3,1

[a] Betteraves faisant partie du contingent de base ; zones intéressées : Aisne, Somme, Oise (France). - [b] Août 1972. - [c] Prix du marché dans la République fédérale d'Allemagne (Hanovre) en août 1972. - [d] Prix moyen à la production pour les pommes de terre de table provenant de la récolte principale dans la République fédérale d'Allemagne. - [e] En vigueur à partir du 15 septembre 1972. - [f] Prix fictif (égal à 91 % du prix d'orientation pour les bovins). - [g] "poulets ♂ TP ♀" (plumés, vidés, sans tête ni pattes, mais avec le coeur, le foie et le gésier). - [h] Valable du 1er août 1972 au 31 octobre 1972. - [i] Oeufs en coquille de volaille de basse-cour, frais ou conservés (hypothèse fondée sur la catégorie A4 : 55 à 60 g par oeuf).

Source : Direction générale de l'agriculture, direction économie et structures agricoles, Informations CEE : marchés agricoles, prix (produits animaux et végétaux), Bruxelles, éditions de l'année en cours. - Calculs et estimations de l'auteur.

("agneaux gris"/fattened calves[1]). In the enlarged Community the United Kingdom will be by far the largest producer of mutton and lamb. The average guaranteed price for fat sheep in the United Kingdom in 1968/69 - 1970/71 was fixed at 0.91 of the guaranteed prices for clean fat cattle. This coincides exactly with the price ratio at the producer level in France, which is why we fixed the fictitious guide price in a hypothetical common market in mutton and lamb at 91 % of the guide price for beef and veal.

A relatively large increase in the price of skimmed milk powder was also suggested, in response to the desire to give greater value to milk protein than to milk fat. However, in view of the Decision of the European Council of Ministers on prices for 1973/74 (reduction of the butter intervention price by 5.4 % and increase in the intervention price for dried skimmed milk y 18.5 % compared with 1972/73), our milk fat / milk protein ratio for 1977/78 seems rather "conservative".

The floating of the UK and Irish pound which began at the end of June 1972 leads to some difficulties in converting the hypothetical prices, expressed in European Communities' units of account, into pounds as the fluctuations which have since occurred in the rate of exchange of the pound will mean a considerable devaluation of the pound in relation to the European Communities' unit of account if the parity of the pound should be fixed again. The related problems are discussed in detail in the individual studies on the "United Kingdom" and "Ireland".

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[1] Statistical Office of the European Communities, loc. cit., p. 98.

In the studies on the United Kingdom, Denmark and Ireland it was unnecessary to give a detailed description of agriculture and agricultural policy in these countries, as adequate details have already been provided in previous studies[1].

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[1] J. Schüler Landwirtschaft und Agrarpolitik in einigen westeuropäischen Ländern. II. Dänemark, Commission of the European Communities, Internal Information on Agriculture, No 57, Brussels, April 1970.

R. Schmidt Landwirtschaft und Agrarpolitik in einigen westeuropäischen Ländern. V. Vereinigtes Königreich, loc. cit., No 66, Brussels, December 1970.

R. Schmidt Landwirtschaft und Agrarpolitik in einigen westeuropäischen Ländern. VIII. Irland, loc. cit., No 73, Brussels, May 1971.

DENMARK

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I. Domestic demand for selected agricultural products in Denmark

1. The methods applied in the demand analysis

The following demand analysis is limited to a pure time-series analysis[1]. The period of investigation covers in general the 13 calendar years from 1958 to 1970 or the 13 farm years from 1957/58 to 1969/70. Only in exceptional cases (excluding the base years) was reference made to a shorter period, in particular when reliable data were available only for a shorter period or when there was a clear break in the structure of consumption habits in the period of investigation. The level of per capita consumption Q was always analysed.

The following are taken into consideration as explanatory variables :

- the real private per capita consumption (at 1955 prices) : C_{pr}
- the real price of the product - i.e. the retail price index for the product, divided by the cost-of-living index, or the wholesale price index for the product, divided by the wholesale price index of all consumer goods (1963/64 = 100 or 1964 = 100) : P_1
- the real price of a competing product : P_2, several competing products : P_2, P_3,... or a combination of competing products : P_2^I and
- time t.

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[1] In contrast, in a past Danish investigation a cross-section analysis of a household sample was also carried out together with time-series analyses. Cf. P.S. Andersen, P. Guldager, A.Schmelling, J. Vibe-Pedersen, H.E. Zeuthen, Projections of Supply and Demand for Agricultural Products in Denmark (1970-1980). Aarhus 1969. P.S. Andersen, H.E. Zeuthen, J. Vibe-Pedersen, Denmark. Part I : Historical Analysis and Projection of the Demand for Food. In: Europe's Future Food and Agriculture. A Comparison of Models for Projecting Food consumption and Agricultural Production in Western European Countries to 1972 and 1975. Ed. by A.M.M. McFarquhar, Amsterdam, London,1971, Page 51 et seq.

The data showed that only for relatively few products did the level of per capita consumption clearly increase as time passed. For many products it followed a clear downward trend.

The choice of functions was made as follows : for products with rising per capita consumption only those function types were accepted in which the elasticity of the level of per capita consumption in relation to real private per capita consumption - referred tobelow as "income elastcity" - falls with rising real per capita consumption - referred below as "income". At the outset, therefore, the function types are limited to[1]

(1) $Q = a + b\, C_{pr} + g\,(P_1, P_2, \ldots)$

with $b > 0$ and $a + g\,(P_1, P_2, \ldots) < 0$

(2) $Q = a + b \log C_{pr} + g\,(P_1, P_2, \ldots)$

(3) $\frac{1}{Q} = a + b\,\frac{1}{C_{pr}} + g\,(P_1, P_2, \ldots)$

(4) $\log Q = a - b\,\frac{1}{C_{pr}} + g\,(P_1, P_2, \ldots)$

(5) $Q = a - b\,\frac{1}{C_{pr}} + g\,(P_1, P_2, \ldots).$

Functions (2) to (5) are here so arranged that the fall in (positive) income elasticity with rising income is weakest in (2) and strongest in (5), when income elasticity in the base year is smaller than 1[2], which in Denmark is to be expected for most products.

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[1] Cf. E. Wöhlken, Demand Models. In: Agricultural Projections. II. Possibilities for the application of certain models, methods and techniques in the Community. Internal bulletins on Agriculture, No. 63, Brussels, October 1970, p. 89 et seq.

[2] Ibid, p. 99.

In order to limit the amount of calculation, only function types 52) and (5) were used in the following demand analyses. Equation (1) was eliminated because it fulfills the condition of a falling income elastciity only with certain qualifications. Of the remaining four equations, (2) and (5) were chosen because, as regards decreasing income elasticity, they represent extreme conditions and because both give a direct instead of a transformed explanation of the level of per capita consumption so that in both cases the test statistics are fully comparable with each other.

For products with a falling per capita consumption the negative income elasticity in its absolute value, i.e. without a + or - sign, could similarly be required to fall with rising income so that with a constant increase in income, other things being equal, the per capita consumption falls at an ever slower rate. In this case only the function types :

$$(6)\quad \log Q = a + b \frac{1}{C_{pr}} + g\,(P_1, P_2, \ldots) \text{ and}$$

$$(7)\quad Q = a + b \frac{1}{C_{pr}} + g\,(P_1, P_2, \ldots)$$

would be taken into consideration for these products if, according to its absolute value, the income elasticity in the base year is less than 1[1], which in Denmark is to be expected for the products concerned. Other functions, such as

$$(8)\quad Q = a - b\, C_{pr} + g\,(P_1, P_2, \ldots) \text{ and}$$

$$(9)\quad Q = a - b \log C_{pr} + g\,(P_1, P_2, \ldots)$$

lead to the absolute value of (negative) income elasticity increasing with rising income.

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[1] Cf. E. Wöhlken, Demand Models, loc. cit., p. 99.

If it has just been a matter of substitution processes in which the products with negative income elasticity were replaced by those with positive income elasticity, such a phenomenon whereby the absolute value of (negative) income elasticity for one set of products increases with rising income while for another set of products the positive income elasticity falls with rising income, would be difficult to explain. This phenomenon appears plausible, however, when the per capita consumption of a good falls not only because this good is replaced for another but when consumption habits on the whole change to such an extent that the food intake is generally reduced, for example, for nutritional reasons. This seems to be extremely probable in Denmark where the nutrition level is very high. For this reason, funtions (7) and (9), which correspond to functions (5) and (2), were chosen for products with falling per capita consumption.

In cases where the short-term trend is real private per capita consumption clearly has no or only very little influence on demand, but where consumption habits are characterized above all by the long-term income trend , the income variable C_{pr} was left out and the development of the per capita consumption of the good in question explained by a time trend.

As regards the form in which the prices are included in the demand functions, the general view is that the direct price elasticity must be negative and the cross-price elasticity positive in the case of substitutes and negative in the case of complementary goods. It is difficult to establish a priori whether, other things being equal, these price elasticities increase or decrease with rising prices.

There is a view that, other things being equal, the higher the price the greater the price elasticity, because price changes have a more noticeable effect on income the higher prices are. Such an assumption leads naturally to constraints as regards the form in which the price variables can be incorporated into the demand functions. The price of the good under investigation can be introduced only linearly or logarithmically and the price of competing products only linearly[1].

We have not accepted the last constraint but have chosen here also the linear or the logarithmic form so that the demand function types used are represented as follows:

$$(10) \quad Q = a + b \log C_{pr} + c_1 \log P_1 + c_2 \log P_2$$

$$(11) \quad Q = a + b \log C_{pr} + c_1 P_1 + c_2 P_2$$

$$(12) \quad Q = a + b \frac{1}{C_{pr}} + c_1 P_1 + c_2 P_2$$

$$(13) \quad Q = a + b \frac{1}{C_{pr}} + c_1 \log P_1 + c_2 \log P_2$$

$$b \gtrless 0, \; c_1 < 0, \; c_2 > 0$$

In many cases there is, in addition, the trend function

$$(14) \quad Q = a + b\,t.$$

The estimates based on the least squares method showed that results obtained with the separate function types (10) to (13) were generally so close that the estimating functions could, in practice, be regarded as equivalent. For this reason and for the sake of uniformity the type (10) estimating equation was generally used for forecasting in the demand analysis which follows.

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[1] Cf. E. Wöhlken, Demand Models, loc. cit., p. 101.

2. Retrospective analysis of domestic demand for various foodstuffs in Denamrk

The stage-by-stage adoption by Denmark of the Common Agricultural Policy resulting from its accession to the European Communities could mean appreciable changes in the real prices of a number of key foodstuffs there. For an evaluation of the effects of these price changes of food consumption, the direct price elasticity and the cross price elasticity for these products must be available. In the following demand special attention will, therefore, have to be paid to calculating these price elasticities.

The effects of changes in per capita income and real prices on per capita food consumption can be calculated in a reasonably unfalsified and statistically supported manner only if certain conditions are fulfilled, namely :

- that the per capita income and the real prices used incorporate the relevant factors for explaining per capita consumption, and that no other important factors be left out of the analysis;
- that the per capita consumption and the factors used to explain it regularly showed significant changes during the period of investigation;
- and that the pattern of consumer behaviour did not alter to any large degree during the period of investigation.

In Denmark per capita income as well as per capita consumption and real prices for many foodstuffs have not fluctuated a great deal since 1960. This is particularly true for real prices since, as a result of Danish agricultural policy, price developments on domestic markets were largely isolated from price fluctuations on world markets. For many foodstuffs these circumstances make it difficult to measure separately the influence

of changes in prices and in incomes on consumption. In these cases only the correlation with income will be shown below. The income elasticity resulting from such an evaluation equation must then be regarded as a weighted mean comprising income elasticity, direct price elasticity and cross price elasticity. Hence, when an income forecast alone is used, this type of equation will produce a meaningful forecast only if during the forecasting period, as in the base period, developments in prices and incomes also correlate closely. If this is not so, the forecast value will give an incorrect estimate if the price elasticity which we have not been able to measure from past data is, in fact, high.

Stronger and more frequent price fluctuations for many foodstuffs were observed in Denmark during the 1950's when there was still a close interrelationship between the domestic market and world markets. For this reason it is possible to calculate the price elasticities for a larger number of products over this period than for the chosen considerable period of investigation starting in 1958. However, it would seem that considerable care should be taken if the price elasticities calculated for the 1950's are used for estimating the effects of coming price adjustments, as these price elasticities belong to a period with a totally different agricultural market order during which consumer behaviour patterns probably differed accordingly.

Neverhteless, the foodstuffs for which it is possible to calculate price elasticities from data for the period 1958 to 1970 also present a considerable problem as regards assessment of the effects of coming price adjustments. For these price elasticities are probably valid chiefly for changes in prices that are generally regarded as temporary whilst, after Denmark's accession to the European Communities, it is the level of prices that will change. To cover this eventuality all estimated price elasticities are indicative only to a limited extent. They should, therefore, only be regarded as aids to evaluating consumer reaction to the coming change in price levels.

a. Wheat

Complete supply situation statements for wheat are available only for the period 1962/63 to 1969/70. For the years 1957/58 to 1961/62 neither the changes in wheat flour stocks nor external trade in wheat flour and bakery products are included in the supply situation statements; in addition, for the years 1957/58 to 1959/60 the latter do not include the changes in unmilled stocks. The demand analysis was, therefore, restricted to the eight years from 1962/63 to 1969/70, in which the per capita consumption of wheat fell almost continuously, whereas in the preceding period certain fluctuations in the per capita consumption had been observed, but these might be due in their entirely, to the incomplete statistics on stock changes and external trade.

The real price for bread, flour and semolina, which were taken from the cost-of-living index, was chosen as the price variable. A price variable better tailored to wheat is unfortunately not available from this index.

As both real consumer expenditure per head of population and the real price of bread, flour and semolina rose constantly during the period of investigation there is a high correlation between both explanatory variables and between them the factor time. Therefore the respective influence of the income and price variables on demand could not be differentiated. Only a simple regression was, therefore, possible with income or price or time. This gave the following regression with income[1]:

Period : 1962/63 - 1969/70

(15) $Q = 196.51 - \underset{(5.4)}{37.07} \log C_{pr}$

$R^2 = 0.827$ $\quad \frac{\hat{\sigma}}{Q} = 1.4\ \%$ $\quad$ D.W. 1.23

Income elasticity[2]: - 0.3

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[1] The number in brackets under the regression coefficient is the quotient found on dividing the regression coefficient by its standard deviation; R^2 is the degree of accuracy,, $\frac{\hat{\sigma}}{Q}$ is the relative standard error and D.W. the Durbin-Watson statistic.

[2] Calculated for the mean value of Q.

However, since the annual decrease in per capita consumption rapidly decelerated during the last few years of the period of investigation, a much better adjustment was achieved by means of the following regression with time :

Period : 1962/63 - 1969/70

(16) $Q = 57.52 - 5.12 \log t$ (t = 1 for 1962/63)

$R^2 = 0.874$ $\frac{\hat{\sigma}}{Q} = 1.2\ \%$ D.W. = 2.02

b. Rye

As regards the completeness of the supply situation statements, the same is true for rye as for wheat. Since in the case of rye, the omission of changes in unmilled rye stocks is obviously not reflected in food consumption and since the omission of stock changes and external trade in flour and bakery products can lead to only an insignificant distorsion of per capita consumption because of the small volume of these items, we have here extended the demand analysis to the whole period from 1957/58 to 1969/70. The per capita consumption of rye fell continuously during this period.

As with wheat the real price index for bread, flour and semolina was chosen as the explanatory variable in addition to the real consumer expenditure per head of the population. Despite the considerably longer period of investigation compared with that for wheat, the influence of both variables on demand could again not be separated because of the continuing high correlation between both variables, so that here too we had to limit ourselves to simple regressions with income, price or time. This resulted in almost equal regressions with income and time :

Period: 1957/58 - 1969/70

(17) $Q = 181.02 - 41.053 \log C_{pr}$
(17.6)

$R^2 = 0.966$ $\quad \frac{\hat{\sigma}}{Q} = 2.1\ \%$ $\quad$ D.W. = 1.34

Income elasticity: - 0.7

and

(18) $Q = 30.59 - 0.712\ t$
(17.9)

$R^2 = 0.967$ $\quad \frac{\hat{\sigma}}{Q} = 2.1\ \%$ $\quad$ D.W. = 1.11,

while the regression with price came out very much worse ($R^2 = 0.67$). When the price variable was added to both equations, this gave the nonsensical result that rye consumption increases with rising prices.

c. Oats

As with per capita consumption of wheat and rye, per capita consumption of oats decreased almost steadily between 1957/58 and 1969/70, the period under investigation. Therefore, here too, the result was an almost equal regression with income and time:

Period: 1957/58 - 1969/70

(19) $Q = 75.972 - 17.945 \log C_{pr}$
(6.2)

$R^2 = 0.777$ $\quad \frac{\hat{\sigma}}{Q} = 8.4\ \%$ $\quad$ D.W. = 1.39

Income elasticity: - 1.0

and

(20) $Q = 10.23 - 0.314\ t$ $\quad$ (t = 1 for 1957/58)
(6.4)

$R^2 = 0.790$ $\quad \frac{\hat{\sigma}}{Q} = 8.2\ \%$ $\quad$ D.W. = 1.34

d. Beef

The following demand analysis for beef relates to the entire period from 1958 to 1970. The real price index for beef and the real price index for pigmeat, both of which were taken from the cost-of-living index, were employed as explanatory price variables.

The result of all the tests was that the real pigmeat price in relation to the other explanatory variables produced no significant explanation for beef consumption. The best result was:

Period: 1958 - 1970

$$(21)\quad Q = -67.765 + \underset{(2.0)}{27.235} \log C_{pr} - \underset{(2.8)}{0.20802}\, P_1 + \underset{(0.1)}{0.01863}\, P_2$$

$R^2 = 0.841$ $\qquad \frac{\hat{\sigma}}{Q} = 4.7\ \%$ $\qquad$ D.W. = 1.53

income elasticity: + 0.7

direct price elasticity: - 1.1

elasticity in relation to pigmeat: + 0.1

P_1 real beef price (1964=100)

P_2 real pigmeat price (1964=100)

This result may be explained, among other things, by the fact that the real pigmeat price is closely correlated to real private consumer expenditure per head of population since both the real pigmeat price and C_{pr} rose almost continuously during the period of investigation.

The evaluation was, therefore, repeated without taking into consideration the real pigmeat price:

Period: 1958 - 1970

$$(22)\quad Q = -3.9527 + \underset{(7.1)}{28.577 \log C_{pr}} - \underset{(3.1)}{43.921 \log P_1}$$

$R^2 = 0.839$ $\qquad \frac{\hat{\delta}}{Q} = 4.5\ \%$ $\qquad$ D.W. = 1.54

income elasticity: + 0.7

direct price elasticity: - 1.1

P_1 real beef price (1964=100)

In any case the consideration of the real pigmeat price in the projection deserves special attention. Since this price is not contained in the above evaluation equation (22) because it was closely correlated to income in the period of investigation, no significant error will be made in the projection of the per capita consumption of beef with the aid of the equation only if the real pigmeat price is also closely correlated to income in the projection period.

e. Pigmeat

As with beef, the real price index for beef and the real price index for pigmeat were employed as explanatory price variables.

In estimating a demand equation for pigmeat including per capita income and both the prices stated, the close correlation already mentioned between per capita income and the real pigmeat price naturally became so noticeable that the parameters could be estimated only with great uncertainty.

Period: 1958 - 1970

$$(23)\quad Q = 150.86 - \underset{(1.3)}{21.176} \log C_{pr} + \underset{(1.3)}{25.553} \log P_1 - \underset{(1.0)}{44.440} \log P_2$$

$R^2 = 0.870$ $\qquad \frac{\hat{\sigma}}{Q} = 3.3\ \%$ $\qquad$ D.W. = 1.82

income elasticity: - 0.3
direct price elasticity: - 0.6
elasticity in relation to beef price: + 0.3

P_1 real beef price (1964=100)
P_2 real pigmeat price (1964=100)

In order to avoid the problem of correlation between the explanatory variables, further calculations were made with the quotients produced by dividing the beef price by the pigmeat price. The result was the following evaluation equation:

Period: 1958 - 1970

$$(24)\quad Q = 113.51 - \underset{(6.2)}{30.538} \log C_{pr} + \underset{(1.5)}{17.640} \log \frac{P_1}{P_2}$$

$R^2 = 0.870$ $\qquad \frac{\hat{\sigma}}{Q} = 3.1\ \%$ $\qquad$ D.W. = 1.59

income elasticity: - 0.4
price elasticity : - 0.2
elastictiy in relation to beef price: + 0.2

P_1 real beef price (1964=100)
P_2 real pigmeat price (1964=100)

This equation affords no basic improvement over the previous equation (23). It shows, however, that given errors of multicollinearity between the explanatory variables the influence of income on the demand for pigmeat is clearly significant. The decisive disadvantage of the

equation (24) is that it assumes that the absolute values of the direct price elasticity and the cross price elasticity are equal, whereas it seems plausible that the direct price elasticity is greater than the cross price elasticity as equation (23) showed. For that reason, we will return this equation in the subsequent projection.

f. Poultrymeat

Here the period of investigation was also from 1958 to 1970. Unfortunately no retail price index was available for poultrymeat. Therefore, the Copenhagen wholesale price for Class 1 broilers (expressed in index form) divided by the wholesale price index for consumer goods was chosen as the price variable for poultrymeat. The wholesale price for meat and meat products divided by the wholesale price index of consumer goods was taken as the price variable for competing products. The estimates do not take into account any influence of the prices of other types of meat on the consumption of poultrymeat. The best evaluation equation was:

Period: 1958 - 1970

$$(25)\quad \hat{Q} = -11.885 + \underset{(8.2)}{6.6813} \log C_{pr} - \underset{(2.6)}{4.8734} \log P_1$$

$R^2 = 0.884$ $\qquad \frac{\hat{\sigma}}{Q} = 5.1\ \%$ $\qquad$ D.W. = 1.57

income elasticity: + 0.8

direct price elastictiy: - 0.6

P_1 real wholesale price index for broilers (1964=100).

g. Offals

Danish statistics include figures for the production, export and human consumption of bovins and pig offals only, but the offals of other animals may be disregarded in a consumption analysis. Since beef and pigmeat production, with a share of over 90 % (1970), clearly dominate the production of meat, bovine and pig offals also account for a correspondingly large proportion of the total production of offals.

An investigation of the period 1958 - 1970 shows that the per capita consumption of offals steadily increased up to 1967 and then levelled out subsequently. This means that the development of consumption was very closely related to developments in domestic supply. Given an almost constant level of offal exports the steady increase slaughterings - particularly of pigs - up to the middle of the 1960's resulted in a constantly expanding domestic supply. When, during the subsequent period, the slaughterings of cattle and pigs levelled off, the domestic supply of offals also remained constant, resulting in little or no increase in consumption.

This type of supply-induced development in consumption could quite easily be explained by an econometric analysis if an abundant supply of offals results from falling real prices for offals and a tight supply from rising real prices. However, as no prices for offals, particularly liver, were available, it was not possible to carry out a meaningful econometric analysis of the per capita consumption of offals. Naturally a simple regression of per capita consumption of offals with income, particularly for the years 1958 - 1967, would have given a good adjustment. But it is likely that an income elasticity calculated in this way would be too great since the increase in consumption was probably also due to a fall in the real price for liver just as it is likely that the recent

stagnation in per capita consumption was the result of a rise in the real price of liver. An econometric analysis of the per capita consumption of offals had, therefore, to be abandoned for lack of data.

h. All meat (excluding offals)

In order to obtain a consistency test for forecasts for individual types of meat, a demand equation for meat as a whole (excluding rabbit and game as well as offals) was also drawn up. The retail price indexes for meat and meat products and for fish and fish products, divided by the cost-of-living index in each case, were chosen as explanatory price variables. The following evaluation equation was produced :

Period : 1958 - 1970

$$(26) \quad Q = 8.7393 - \underset{(0.3)}{4.0930} \log C_{pr} - \underset{(1.1)}{48.813} \log P_1 + \underset{(3.7)}{78.536} \log P_2$$

$R^2 = 0.656 \qquad \frac{\hat{\sigma}}{Q} = 2.0\ \% \qquad D.W. = 2.70$

income elasticity : -0.03
elasticity in relation to meat prices : - 0.2
elasticity in relation to fish prices : + 0.3

P_1 real retail price index for meat and meat products (1964=100)
P_2 real retail price index for fish and fish products (1964=100)

The insignificant, minute, negative income elasticity corresponds with a positive income elasticity for beef and poultrymeat and a negative income elasticity for pigmeat in previous results. The fact that the aggregate direct price elasticity is lower than the direct price elasticities for the three types of meat considered individually is due to the fact that not only must it be seen as the mean value of the (negative) price elasticities of the individual types of meat, but also includes the (positive) cross price elasticities of those types.

It is possible that the above equation would have been improved still further by the inclusion of the real prices of other competing products (cheese, eggs). However, the low degree of accuracy in comparison with the considerably higher degree of accuracy in many other equations is mainly due to the fact that the total per capita consumption of meat shows hardly any trend. In view of a standard deviation in the equation, relative to the mean value of meat consumption, of only 2.0 %, which is considerably lower than in the equations for the individual types of meat, the above equation ought not to produce forecasts any worse than the individual equations in spite of the low degree of accuracy.

i. Eggs

The consumption of eggs as food shown in the statistics is made up of the statistically assessed market production, on the one hand, and an estimated value for eggs consumed as food by farmers and direct sales by farmers, on the other. The proportion of this estimate in relation to total consumption has stood in recent years at around 30 %, compared with 40 % and over ten years ago. As these estimates of farm consumption and direct farm sales are naturally very approximate and have mainly been calculated at constant values since 1964, the overall per capita consumption seems to be of only doubtful indicative value. Therefore, the per capita consumption of marketed production as food will also be analysed below, in addition to the overall per capita consumption.

Examination of both values for the period 1958 to 1970 shows that the per capita consumption of eggs increased steadily up to 1963, remained constant between 1964 and 1966 and then fell sharply. This reversal may be exaggerated in the figures shown in the statistics as the direct sale

of eggs by farmers probably increased[1] as a result of the marketing regulations introduced in 1962, whereas the 1963 and 1964 statistics show these sales to have decreased and thereafter to have remained constant. The extent of the underestimation cannot, however, be assessed.

It proved impossible to find a satisfactory evaluation equation for the entire observation period from 1958 to 1970. Therefore, the investigation period was limited to the seven years from 1964 to 1970.
This gave :

Period: 1964 - 1970

(27) $Q = 77.346 - \underset{(10.1)}{13.915} \log C_{pr} - \underset{(1.1)}{5.9399} \log P_1$

$R^2 = 0.975$ $\quad \frac{\hat{\sigma}}{Q} = 0.9\ \%$ $\quad$ D.W. = 1.90

income elasticity: - 0.5
direct price elasticity: - 0.2

(28) $Q^M = 65.461 - \underset{(8.2)}{13.486} \log C_{pr} - \underset{(0.4)}{2.4851} \log P_1$

$R^2 = 0.960$ $\quad \frac{\hat{\sigma}}{Q} = 1.5\ \%$ $\quad$ D.W. = 2.61

income elasticity: - 0.7
direct price elasticity: - 0.1

Q total per capita consumption of eggs
Q^M per capita consumption of marketed eggs
P_1 real retail price of eggs (1964=100)

Equation (28) for the per capita consumption of marketed eggs shows that changes in the real egg price clearly have no significant influence on the market demand for eggs The calculated price elasticity is very small and statistically very close to zero. Therefore, the

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[1] Cf. P.S. Andersen, ..., Projections ..., loc. cit., p. 70.

equation was again estimated without taking the egg price into account, and, as expected, the result was no worse:

Period: 1964 - 1970

$$(29)\quad Q^M = 61.758 - \underset{(10.8)}{13.820} \log C_{pr}$$

$$R^2 = 0.959 \qquad \frac{\hat{\sigma}}{Q} = 1.5\ \% \qquad \text{D.W.} = 2.53$$

income elasticity: - 0.7

Q^M per capita consumption of marketed eggs

P_1 real retail price of eggs (1964=100)

If the market demand for eggs seems to be unrelated to price, the demand for eggs as a whole must be independent of price, as the total demand is composed of the market demand and a constant , and therefore price-independent estimate of the farm demand for eggs and of direct farm sales. The fact that the price of eggs was shown to have a greater influence on consumption in the equation for the per capita consumption as a whole than in the equation for the per capita consumption of marketed eggs must not, therefore, be seen as an indication of a rather short-term consumer reaction but is purely fortuitous and attributable to the fact that there is a higher correlation between the trends in the individual variables because of the assumed constant level of farm consumption and direct farm sales.

j. Whole milk

Here the investigation period was limited to the year 1959 to 1970, since the 1958 whole milk price was completely outside the limits imposed by the market regulation implemented in 1959.

The per capita consumption of whole milk in Denmark was steady. Therefore, it is to be expected that a high proportion of the fluctuations in the per capita consumption is governed by fortuitous events. In spite of this, the following equation was formulated:

Period: 1959 - 1970

$$(30)\quad Q = 241.94 - \underset{(2.0)}{12.329} \log C_{pr} - \underset{(2.9)}{52.492} \log P_1$$

$R^2 = 0.490$ $\qquad \frac{\hat{\delta}}{Q} = 1.1\ \%$ $\qquad$ D.W. = 1.77

income elasticity: - 0.1

direct price elasticity: - 0.3

P_1 real retail price for whole milk (1964=100)

This equation shows a small but significant influence of both income and the price of milk on whole milk consumption.

k. Selected milk products

In addition to the per capita consumption of whole milk, the per capita consumption of (a) whole milk in chocolate milk, sour milk and yoghourt, (b) double cream, (c) other cream and (d) cream in ice cream was also analysed. As no series of retail or wholesale prices covering a sufficiently long period was available for any of these products, developments in per capita consumption could here only be explained by developments in income. Nevertheless this was generally extremely informative, since the trend in per capita consumption of all products was very steady. Thus, the slight increase in per capita consumption of double cream was more or less constant whilst the per capita consumption of other cream declined constantly. In both cases, the entire period from 1958 to 1970 was included in the regression calculation. The per capita consumption of chocolate milk, sour milk and yoghourt was, however, steady until 1961 and that of cream in ice cream until 1964. Only after this did it show a fairly steady upward

trend. For these two groups of products the investigation period was limited to the years 1964 to 1970. The following equations were formulated for the individual groups:

(a) Whole milk in chocolate milk, sour milk and yoghourt

Period: 1964 - 1970

(31) $Q = -262.01 + 69.360 \log C_{pr}$
(17.4)

$R^2 = 0.984$ $\frac{\hat{\sigma}}{Q} = 7.4\ \%$ D.W. = 3.02

income elasticity: + 6.1

(b) Double cream

Period: 1958 - 1970

(32) $Q = -15.384 + 5.1469 \log C_{pr}$
(13.1)

$R^2 = 0.940$ $\frac{\hat{\sigma}}{Q} = 2.2\ \%$ D.W. = 0.89

income elasticity: + 0.5

(c) Other cream

Period: 1958 - 1970

(33) $Q = 39.648 - 9.6846 \log C_{pr}$
(15.9)

$R^2 = 0.959$ $\frac{\hat{\sigma}}{Q} = 4.9\ \%$ D.W. = 1.76

income elasticity: - 1.5

(d) Cream in ice cream

Period: 1964 - 1970

(34) $Q = -50.218 + 13.546 \log C_{pr}$
(7.4)

$R^2 = 0.916$ $\frac{\hat{\sigma}}{Q} = 8.7\ \%$ D.W. = 1.78

income elasticity: + 3.1

1. Butter

In the case of butter the investigation period was limited to the years 1959 to 1970, as per capita consumption of butter in 1958 was abnormally high as a result of the sale of cheap cold-store butter. The per capita consumption of butter shows a clear downward trend. The estimates showed that the declining per capita consumption of butter could best be represented by a linear trend.

Period: 1959 - 1970

(35) $Q = 11.233 - 0.17692\ t$ (t = 1 for 1959)
(14.2)

$R^2 = 0.953$ $\frac{\hat{\sigma}}{Q} = 1.5\ \%$ D.W. = 1.55

A simple correlation with income gave a slightly worse result.

Period: 1959 - 1970

(36) $Q = 48.563 - 10.117 \log C_{pr}$
(11.2)

$R^2 = 0.926$ $\frac{\hat{\sigma}}{Q} = 1.8\ \%$ D.W. = 1.80

income elasticity: - 0.4

Estimates incorporating the real price of butter led to a positive, albeit, insignificant direct price elasticity which contradicts general observations. The not very high correlation between the real price of butter, on the one hand, and income and time, on the other, rules out the possibility that this result was due to collinearity between the explanatory variables.

m. Margarine

In the case of margarine the investigation period was also limited to the period from 1959 to 1970, since in 1958 the per capita consumption of margarine was greatly influenced by the sale of cheap cold-store butter. Like per capita consumption of butter, that of margarine, which is nearly twice as high as that of butter, also shows a clear downward trend which is best represented by the following trend function :

Period: 1959 - 1970

(37) $Q = 19.077 - \underset{(7.0)}{0.11958}\ t$ (t = 1 for 1959)

$R^2 = 0.831$ $\quad \frac{\hat{\sigma}}{q} = 3.5\ \%$ $\quad$ D.W. = 2.14

Indeed a simple correlation with income gave only a slightly worse result.

Period: 1959 - 1970

(38) $Q = 44.481 - \underset{(6.7)}{6.8832}\ \log C_{pr}$

$R^2 = 0.819$ $\quad \frac{\hat{\sigma}}{Q} = 3.7\ \%$ $\quad$ D.W. = 2.10

income elasticity: - 0.2

Although the real price of margarine fluctuated considerably during the investigation period - also in relation to the real price of butter - , the estimates showed no plausible and significant influence of either the real price of margarine, the real price of butter or the quotient found on dividing the price of butter by that of margarine on the per capita consumption of margarine.

n. Lard and tallow

As the data for the per capita consumption of tallow was available only from 1960 onwards, the investigation period was limited to the period from 1960 to 1970. In view of an upward trend in the per capita consumption of lard and tallow a simple regression with income gave a very good result :

Period: 1960 - 1970

(39) $Q = -59.248 + \underset{(7.0)}{16.770} \log C_{pr}$

$R^2 = 0.847$ $\quad \frac{\hat{\sigma}}{Q} = 9.0\ \%$ $\quad$ D.W. = 1.77

income elasticity: + 1.5

The dependence of demand for lard and tallow on their prices could not be investigated because of a shortage of data on prices.

o. Cheese

In the case of cheese the years 1960 to 1970 were chosen as the investigation period, since per capita consumption entered a phase of extensive saturation in 1960 following a period of rapid expansion, thus resulting in a change in structure. After 1960, the per capita consumption of cheese increased only slowly, as the following evaluation equation shows :

Period: 1960 - 1970

(40) $Q = 8.5691 + \underset{(3.5)}{0.07182}\ t$ $\quad$ (t = 1 for 1960)

$R^2 = 0.579$ $\quad \frac{\hat{\sigma}}{Q} = 2.4\ \%$ $\quad$ D.W. = 2.33

(41) $Q = -6.7496 + \underset{(3.3)}{4.1308} \log C_{pr}$

$R^2 = 0.552$ $\quad \frac{\hat{\sigma}}{Q} = 2.5\ \%$ $\quad$ D.W. = 2.42

income elasticity: + 0.2

Here the annual fluctuations can be regarded as fortuitous. The correlation with income is a pure trend correlation. It could not be established that the real price of cheese had an influence on per capita consumption. All estimates incorporating the real price of cheese showed an insignificant positive direct price elasticity. Indeed the fluctuations in the real price of cheese were not very great.

p. Sugar

Per capita consumption of sugar remained constant during the period from 1958 to 1970. No significant correlation was established either with income, with the real retail price of sugar or with time.

q. Potatoes

Per capita consumption of potatoes decreased steadily in the investigation period from 1958 to 1970. Consequently, a linear trend gave the best adjustment.

Period: 1958 - 1970

(42) $Q = 141.96 - \underset{(17.0)}{4.3571}\ t$

$R^2 = 0.963$ $\qquad \frac{\hat{\sigma}}{Q} = 3.1\ \%$ $\qquad$ D.W. = 1.72

It was somewhat worse in the case of a regression with income:

Period: 1958 - 1970

(43) $Q = 1047.4 - \underset{(13.9)}{246.65}\ \log C_{pr}$

$R^2 = 0.946$ $\qquad \frac{\hat{\sigma}}{Q} = 3.8\ \%$ $\qquad$ D.W. = 1.92

income elasticity: - 1.0

r. Apples, pears, tomatoes

Demand analyses for these three products are handicapped by the fact that for pears, the per capita consumption is known only for the years from 1963/64 to 1970/71 and that for all three products prices - and then only wholesale prices - are available only for the years from 1963/64 to 1968/69. Therefore, an attempt was first made to explain per capita consumption in terms of income. This gave :

Apples

Period: 1957/58 - 1969/70

(44) $Q = -55.655 + 20.685 \log C_{pr}$
(2.1)

$R^2 = 0.280$ $\quad \frac{\hat{\sigma}}{Q} = 10.3\ \%$ $\quad$ D.W. = 2.92

income elasticity: + 0.4

(45) $Q = -24.117 + 12.563 \log C_{pr}$
(1.4)

$R^2 = 0.287$ $\quad \frac{\hat{\sigma}}{Q} = 3.3\ \%$ $\quad$ D.W. = 2.51

income elasticity: + 0.2

Pears

Period: 1963/64 - 1969/70

(46) $Q = -26.780 + 7.7875 \log C_{pr}$
(1.7)

$R^2 = 0.375$ $\quad \frac{\hat{\sigma}}{Q} = 13.0\ \%$ $\quad$ D.W. = 2.45

income elasticity: + 1.1

Tomatoes

Period: 1957/58 - 1969/70

(47) $Q = -46.462 + 14.055 \log C_{pr}$
(9.5)

$R^2 = 0.890$ $\quad \frac{\hat{\sigma}}{Q} = 5.1\ \%$ $\quad$ D.W. = 2.54

income elasticity: + 0.9

Period: 1963/64 - 1969/70

(48) $Q = -34.177 + 10.866 \log C_{pr}$
(3.4)

$R^2 = 0.694$ $\quad \frac{\hat{\sigma}}{Q} = 3.9\ \%$ $\quad$ D.W. = 2.80

income elasticity: + 0.6

These estimating equations show that in all three cases the development of per capita consumption can in no way be wholly explained by the development of income. However, estimates for the six years, for which at least a wholesale price was available, produced the result that the movements in wholesale prices cannot explain the pronounced fluctuations in per capita consumption either. In all three cases, contrary to expectations, the estimated direct price elasticities were positive.

s. Fish

As in the analysis of the per capita consumption of all types of meat, the real retail price index for meat and meat products and for fish and fish products, was used as the explanatory price variable for the per capita consumption of fish. It was not established that the real meat price had

any effect on per capita consumption of fish although, conversely, the per capita consumption of all types of meat was dependent on the development of the price of fish. Furthermore, a positive elasticity in fish consumption vis-à-vis the price of fish was established but not significantly different from zero. This left only the following regression with income :

Period : 1958 - 1969

(49) $Q = -145.36 + \underset{(5.0)}{43.141} \log C_{pr}$

$R^2 = 0.718$ $\qquad \frac{\hat{\sigma}}{Q} = 9.9\ \%$ $\qquad$ D.W. = 1.69

income elasticity : + 1.0

3. Income, price and population projections until 1977 or 1977/78

In order to project per capita consumption and total consumption in 1977 or, where appropriate, 1977/78 for the individual food products in question by means of the estimated demand functions, projections are required for :

- the real private per capita consumption (in 1955 prices);
- retail and/or wholesale prices of the products concerned and for competing products in respect of which the demand analysis indicated a dependence on price (1964=100);
- the cost-of-living index and/or the wholesale price index for consumer goods (1964=100);
- the population;

for 1977 or, where appropriate, 1977/78.

Table 1 - Income and price elasticities[a] of the per capita consumption of selected foodstuffs in Denmark

Product	Period	Income elasticity	Direct price elasticity	Cross price elasticity
Wheat	1962/63-1969/70	- 0.3	-	-
Rye	1957/58-1969/70	- 0.7	-	-
Oats	1957/58-1969/70	- 1.0	-	-
Beef	1958-1970	+ 0.7	- 1.1	-
Pigmeat	1958-1970	- 0.3	- 0.6	+ 0.3 (beef)
Poultrymeat	1958-1970	+ 0.8	+ 0.6	-
Offals	1958-1970	-	-	-
Meat-total	1958-1970	- 0.03	- 0.2	+ 0.3 (fish and fish products)
Eggs	1964-1970	- 0.7	-	-
Whole liquid milk	1959-1970	- 0.1	- 0.3	-
Whole milk in chocolate milk, sour milk and yoghourt	1964-1970	+ 6.1	-	-
Double cream	1958-1970	+ 0.5	-	-
Other cream	1958-1970	- 1.5	-	-
Cream in ice cream	1964-1970	+ 3.1	-	-
Butter	1959-1970	- 0.4	-	-
Margarine	1959-1970	- 0.2	-	-
Lard and tallow	1960-1970	+ 1.5	-	-
Cheese	1960-1970	+ 0.2	-	-
Sugar	1958-1970	-	-	-
Potatoes	1958-1970	- 1.0	-	-
Apples	1963/64-1969/70	+ 0.2	-	-
Pears	1963/64-1969/70	+ 1.1	-	-
Tomatoes	1963/64-1969/70	+ 0.6	-	-
Fish	1958-1969	+ 1.0	-	-

[a] The respective elasticities were calculated for the mean value of per capita consumption during the period indicated.

Source: Own calculations.

a) Real private per capita consumption per head of the population

Real private per capita consumption increased at an average annual rate of 4.3% from 1958 to 1970. It is, however, expected that the growth rate will be considerably lower between 1970 and 1985[1]. On the one hand, the growth rate for the real gross domestic product should fall to just over 3 per cent. Assuming that the average consumption ratio remains unchanged, this would correspond to a rate of increase of about 2.5% in real per capita consumption. However, even this rate would have to be reduced if the proportion of government expenditure in the gross domestic product is to increase further and if the deficit in external payments is to be overcome. On the other hand, it can be expected that Danish entry into the EEC will in the long term have a favourable influence on productivity in Denmark with the result that the growth rate of the real gross domestic product should be considerably higher than 3%, with Danish entry into the EEC thus increasing the scope for domestic private consumption. This means that, in projecting the per capita consumption of the various foodstuffs, a annual growth rate of 2.5% in real private per capita consumption is assumed (real private per capita consumption in 1977 : Dkr 9 500; in 1977/78 : Dkr 9 600).

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[1] Problems of Long-Term Economic Planning, Vol. 1. General Report, Vol. 2 Appendices, Copenhagen, March 1971. Quoted from OECD, Economic Surveys, Denmark, Paris, July 1971, p. 32 et seq.

Table 2 - Population, prices and real private consumption in Denmark 1958-1970(1957/58-1969/70), 1977(1977/78)[b]

Period	Population 1.1. ('000)	Population 1.7. ('000)	Cost-of-living index (1964=100)	Wage adjustment index (1964=100)	Wholesale price index for consumer goods (1955=100)	Real private per capita consumption (Dkr)		Period
1958	4 501	4 515	79,8	79,8	102	4 227	4 731[a]	1957/58
1959	4 532	4 547	81,2	81,2	103	5 059	4 942[a]	1958/59
1960	4 566	4 581	82,2	82,2	102	5 262	5 159[a]	1959/60
1961	4 594	4 610	85,1	85,1	105	5 635	5 451[a]	1960/61
1962	4 630	4 647	91,4	91,4	110	5 941	5 787[a]	1961/62
1963	4 666	4 684	96,9	96,7	115	5 877	5 908[a]	1962/63
1964	4 703	4 720	100,0	100,0	117	6 332	6 104[a]	1963/64
1965	4 741	4 758	106,5	106,2	122	6 512	6 420[a]	1964/65
1966	4 777	4 797	113,6	112,2	126	6 749	6 632[a]	1965/66
1967	4 818	4 839	122,1	117,2	129	6 974	6 862[a]	1966/67
1968	4 853	4 867	131,9	123,2	131	7 051	7 012[a]	1967/68
1969	4 877	4 827	136,5	127,0	136	7 696	7 374[a]	1968/69
1970	4 907	4 921	145,1	134,5	144	7 989	7 838[a]	1969/70
1977	5 130[b]	5 150[b]	204[b]	189[b]	179[b]	9 500[b]	9 610[b]	1977/78

[a] Estimate. [b] Forecast.

Source : Årborg statistics, Denmark, various years. Own calculations.

b. Prices of selected foodstuffs

As the retrospective demand analyses showed, the projection of food consumption requires in any event a projection of retail prices for beef, pigmeat and whole liquid milk as well as of the wholesale price for broilers. In addition, the retail price for butter should also be forecast, although in the demand equation for butter no price influence is discernible. However, the year 1958, although not considered in the regression, does give a certain indication that the demand for butter is not completely price-inelastic.

In projecting these prices the following method was used : the retail prices for beef and pigmeat were first broken down into the three components; value added tax, producer price and/or minimum price and processing costs and trading margins (Table 3).

Value added tax was introduced on 3 July 1967. For the first time foodstuffs, which had in principle been exempted from the previous 12.5% wholesale tax, were covered by it. At first the value added tax rate was 10%. This was increased to 12.5% on 1 April 1968 and to 15% on 1 July 1970.

Minimum prices for beef and veal, pigmeat and bacon, poultry and eggs are fixed for the domestic market on the basis of the Danish market organisation[1]. They do not apply when export prices exceed the minimum prices. In the case of beef this occurred during several periods. We have, therefore, quotet the minimum price if this was above the average price obtained by farmers for animals for slaughter and, conversely, have used this average price if it was higher than the minimum price, average quarterly price being used as the basis for our calculations.

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[1] See on this point, J. Schüller, Landwirtschaft und Agrarpolitik in einigen westeuropäischen Ländern. II. Denmark, loc. cit., p.70 et seq.

Table 3 - Retail price components for selected foodstuffs in Denmark
1963 - 1970, 1977[a] (Dkr/kg)

	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Beef									
Retail price	11.00	12.80	14.13	14.50	15.36	16.69	18.38	20.28	37.27
Value added tax[b]	-	-	-	-	0.73	1.77	2.04	2.46	4.86
Average producer price or minimum price	4.90[c]	5.87	6.01	5.66[d]	5.56[c]	5.65[c]	6.44	7.01	13.25
Processing costs and trading margin	6.10	6.93	8.12	8.84	9.07	9.27	9.90	10.81	19.16
(as % of retail price, excluding tax)	(55)	(54)	(57)	(61)	(62)	(62)	(61)	(61)	(59)
Pigmeat									
Retail price	10.10	10.86	11.35	12.08	13.17	14.37	14.98	16.07	25.16
Value added tax[b]	-	-	-	-	0.63	1.53	1.66	1.95	3.28
Minimum price	4.83	4.91	5.06	5.37	5.45	5.61	5.73	6.02	9.43
Processing costs and trading margin	5.27	5.95	6.29	6.71	7.09	7.23	7.59	8.10	12.45
(as % of retail price, excluding tax)	(52)	(55)	(55)	(56)	(57)	(56)	(57)	(57)	(57)
Butter									
Retail price	9.02	9.07	9.74	10.38	10.93	11.45	11.87	12.52	21.68
Ex-dairy price	8.00	8.08	8.64	9.27	9.69	10.00	10.36	10.82	19.17
Retail price margin including:	1.02	0.99	1.10	1.11	1.24	1.45	1.51	1.70	2.51
Value added tax[b]	-	-	-	-	0.06	0.15	0.17	0.21	0.33
Margin excluding tax	1.02	0.99	1.10	1.10	1.16	1.30	1.34	1.49	2.18

[a] Hypothesis. [b] Estimate: 1967: 5 %; 1968: 11.9 %; 1969: 12.5 %; 1970: 13.8 %; 1977: 15 % of price, excluding tax.
[c] Minimum price. [d] First quarter: Minimum price.

Source: Statistical Yearbook for German Federal Republic, various editions. Landbrugstatistik, herunder gartneri of skovbrug Danmarks, Statistik, Copenhagen, various editions. Own calculations.

On this basis the processing costs and trading margin was shown to be a residual value. In order to forecast this value it was assumed that the margin would show the same average growth rate between 1970 and 1977 as it did between 1963 and 1970.

It was further assumed that when selling animals for slaughter in 1977 the farmer would obtain the guide price for cattle and the basic price for pigs for slaughter[1] given in the introduction - i.e. for cattle Dkr 7.6 per kg live weight equals Dkr 13.25 per kg slaughter weight, and for pigs Dkr 6.88 per kg live weight equals Dkr 9.43 per kg slaughter weight[2].

Finally, for 1977 a value added tax rate of 15% was assumed. These hypotheses give an estimated retail price for beef of Dkr 37.27 per kg in 1977, which is 84% higher than the actual beef price in 1970, and an estimated retail price for pigmeat of Dkr 25.16 per kg, which is 57% higher than the actual pigmeat price in 1970.

The retail price for butter was broken down into the ex-dairy price and the retail price margin, from which the amount of value added tax due on this margin was calculated. In forecasting this retail price margin less value added tax it was further assumed that the margin would show the same average growth rate between 1970 and 1977 as it did between 1963 and 1970. Here too the value added tax rate was calculated at 15% in 1977. Finally, it was assumed that in 1977 the dairy farm price for butter would be the same as the threshold price

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[1] Cf. Table in the introduction.

[2] Calculated on the basis of 1 u.a. = Dkr 7.5783.

for butter (Dkr 16.67 per kg) given in the introduction, plus 15% value added tax. This gives a retail price for butter of Dkr 21.68 per kg in 1977, which is 73% higher than the price for butter in 1970.

Since in the past the retail price for one litre of bottled liquid milk in Denmark has always been about one-tenth of the retail price for one kilo of butter, it was assumed in calculating the price of liquid milk that this ratio would still apply in 1977. On this assumption the retail price for one litre of bottled liquid milk in 1977 will be Dkr 2.17, an increase of 68% compared with the price of liquid milk in 1970.

In forecasting the wholesale price for broilers it was assumed that in 1977 this price would be the same as the sluice-gate price for slaughtered chickens (plucked and drawn, without heads and feet but with hearts, livers and gizzards) given in the introduction, i.e. about Dkr 6.06 per kg.

Table 4 summarizes the results of the price forecasts once more. We would like to point out that the average annual rates of change shown in the table for the years 1970-1977 should not be taken as showing the stages of price adjustment to be expected in Denmark after its adoption of the Common Agricultural Policy. Such a forecast would only be possible if 1972, and not 1970, appeared as the base year and if assumptions on the development of prices after the accession of Denmark to the European Communities were compared with the assumed price developments should Denmark not accede.

Table 4 - Price hypotheses for selected foodstuffs in Denmark 1970, 1977 (1964=100)

Product	1970		1977		1977 Change compared with 1970 (%)		Average annual rate of change (%) between 1970 and 1977	
	nominal	real	nominal	real	nominal	real	nominal	real
Retail prices								
Beef	146	101	269	131	+ 84	+ 31	+ 9.1	+ 1.5
Pigmeat	156	107	244	119	+ 57	+ 11	+ 6.6	+ 1.5
Whole liquid milk	137	94	231	113	+ 68	+ 20	+ 7.7	+ 2.6
Butter	138	94	239	116	+ 73	+ 23	+ 8.2	+ 3.0
Wholesale price								
Broiler chickens	111	90	127	71	+ 14	- 21	+ 1.9	- 3.3

Source: Table 3. Own calculations.

c. The cost-of-living index and the wholesale price index for consumer goods (1964=100)

The cost-of-living index rose from 1960 to 1970 at an average annual rate of 6%. Part of this increase was, of course, due to the fact that in 1967 the former wholesale tax was replaced by a value added tax, which extended taxation to considerably more goods than before and that the value added tax rate has since been raised twice. Allowing for the effects of these changes in indirect taxation, the cost-of-living index rose on average by only 5% per annum from 1960 to 1970[1]. In the same period the wholesale price index rose on average by 3.5% per annum.

In forecasting real prices it is assumed that between 1970 and 1977 the cost-of-living index and the wholesale price index for consumer goods will continue to rise at an average annual rate of 5% (1977: 204) and 3.5% (1977: 179) respectively.

d. Population

The Danish population increased between 1960 and 1970 by an average of 0.7% per annum. Since the growth rate has fallen somewhat recently, it is assumed that the population will increase between 1970 and 1977 by an average of 0.6% per annum (1 July 1977: 5 130 000, 1 January 1978: 5 150 000).

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[1]Calculated from the wage adjustment index.

4. Projections of the per capita and total consumption of important foodstuffs in 1977 or, where appropriate, 1977/78

Table 5 gives estimates of the per capita and total consumption of important foodstuffs in 1977 or, where appropriate, 1977/78. Estimates of per capita consumption were generally based on the estimated demand functions and the previously mentioned income and price hypotheses. In the next few years real private consumption in Denmark will increase at a slower rate than in the past, when certain products showed a better adjustment than that resulting from a regression with income. Nevertheless, a regression with income was in general preferred when forecasting for these products in order to allow for the expected slowdown in income growth. In the case of products for which no demand equation was estimated the per capita consumption was graphically extrapolated on the basis of past trends (maize, rice, mutton and lamb, horse-flesh, skimmed milk, buttermilk).

In connection with these separate estimates, the following should be noted :

The estimate for poultrymeat was put considerably higher than that calculated on the basis of demand equation (25) in order that the estimates for the individual types of meat agree with the overall meat estimate in equation (26). It was assumed that the preference for lean meat would become more marked in Denmark too. In order to be able to forecast the per capita consumption of all meat with equation (25), an estimate of the real retail price of fish and fish products is required. Here it was assumed that the price would continue to increase to 120 (1964=100) in line with the trend in recent years. For offals it was assumed that, following the large increase in the number of cattle and pigs slaughtered as compared with previous years, there would be an equivalent increase in the supply of offals so that domestic demand would be faced with a more plentiful supply of home-produced offals than was the case in recent years.

Table 5 - Human consumption of important foodstuffs in Denmark, 1969 (1969/70) and 1977[a] (1977/78)

Product	Equation used for forecasting	Human consumption							
		per capita				total			
		1969 (1969/70)	1977[a] (1977/78)	change compared with 1969	average annual rate of change	1969 (1969/70)	1977[a] (1977/78)	change compared with 1969	average annual rate of change
		kg		%		1 000 t		%	
Wheat	(16)	53.0	51.4	- 3	- 0.4	260	265	+ 2	+ 0.2
Barley	-	.	.	.	.	1	1	.	.
Maize	-	2.9	2.9	0	0	14	15	+ 7	+ 0.9
Oats	(20)	5.3	3.6	- 32	- 4.7	26	19	- 27	- 3.8
Rye	(17)	22.0	17.5	- 20	- 2.8	108	90	- 17	- 2.3
Rice	-	1.3	1.3	0	0	6	7	.	.
Beef and veal	(22)	21.3	16.7	- 22	- 3.0	104	86	- 17	- 2.3
Pigmeat	(23)	29.7	28.4	- 4	- 0.6	145	146	+ 1	+ 0.1
Poultrymeat	-	4.0	8.0	+100	+ 9.1	20	41	+105	+ 9.4
Mutton, lamb and horse flesh	-	0.6	0.5	- 17	- 2.3	3	3	.	.
Meat-total	(26)	55.6	53.6	- 4	- 0.5	272	276	+ 1	+ 0.2
Offals	-	6.5	8.0	+ 23	+ 2.6	32	41	+ 28	+ 3.1
Eggs	(29)	11.3	9.9	- 12	- 1.6	55	51	- 6	- 0.9
Whole liquid milk	(30)	91.2	85.1	- 7	- 0.9	446	437	- 2	- 0.3
Whole milk in chocolate milk, sour milk and yoghourt	(31)	7.5	13.9	+ 85	+ 8.0	37	71	+ 92	+ 8.5
Double cream	(32)	4.5	5.1	+ 13	+ 1.6	22	26	+ 18	+ 2.1
Other cream	(33)	2.1	1.1	- 48	- 7.8	10	6	- 40	- 6.1
Cream in ice cream	(34)	2.5	3.7	+ 48	+ 5.0	12	19	+ 58	+ 5.9
Skimmed milk	-	15.8	28.0	+ 77	+ 7.4	77	144	+ 87	+ 8.1
Buttermilk	-	12.9	14.0	+ 9	+ 1.0	63	72	+ 14	+ 1.7
Butter	-	9.2	7.3	- 21	- 2.9	45	37	- 18	- 2.4
Margarine	(38)	17.8	17.1	- 4	- 0.6	87	88	+ 1	+ 0.1
Lard and tallow	(39)	5.7	7.5	+ 32	+ 3.5	28	38	+ 36	+ 3.9
Cheese	(41)	9.3	9.7	+ 4	+ 0.5	45	50	+ 11	+ 1.3
Sugar	-	47.5	47.0	- 1	- 0.1	232	241	+ 4	+ 0.5
Potatoes	(43)	94	66	- 30	- 4.3	460	340	- 26	- 3.7
Apples	(45)	25.1	25.9	+ 3	+ 0.4	123	133	+ 8	+ 1.0
Pears	(46)	3.1	4.2	+ 35	+ 3.9	15	22	+ 47	+ 4.9
Tomatos	(48)	8.4	9.1	+ 8	+ 1.0	41	47	+ 15	+ 1.7
Fish	-	19.6	24.0	+ 22	+ 2.6	96	123	+ 28	+ 3.2

[a] Projection.

Source: Annexed tables. Own calculations and estimates.

In the case of butter the estimate of per capita consumption obtained from equation (36) (8.3 kg) was corrected downwards, since a certain price elasticity of the demand for butter was expected. On the basis of the results of a Danish study[1] the price elasticity of butter consumption in relation to the price of butter was assumed to be 0.5. In view of an increase of 23% in the real price of butter between 1970 and 1977, the result was a further decrease of 1 kg in the per capita consumption of butter to 7.3 kg in 1977.

A per capita consumption of 26.2 kg of fish in 1977 was calculated from equation (49). However, this value would appear to be too high in view of the levelling out of fish consumption during the last few years of the period under investigation. The estimate of the per capita consumption of fish was, therefore, reduced to 24.0 kg.

In so far as the projections of per capita consumption were arrived at by using regressions with income as the only explanatory variable or by graphic trend extrapolation, they naturally presented a direct or indirect extension of the development in consumption observed during the period under investigation. This is true of most of the products listed. The influence of real price trends on per capita consumption was taken into account for beef and veal, pigmeat, poultrymeat, whole liquid milk and butter only. Therefore, only in the case of these products are the values forecast for per capita consumption also influenced by the new price developments that will take place after the accession of Denmark to the European Communities.

The real price of beef, which has been rather static over a lengthy period, will rise considerably between now and 1977. The forecast for poultrymeat

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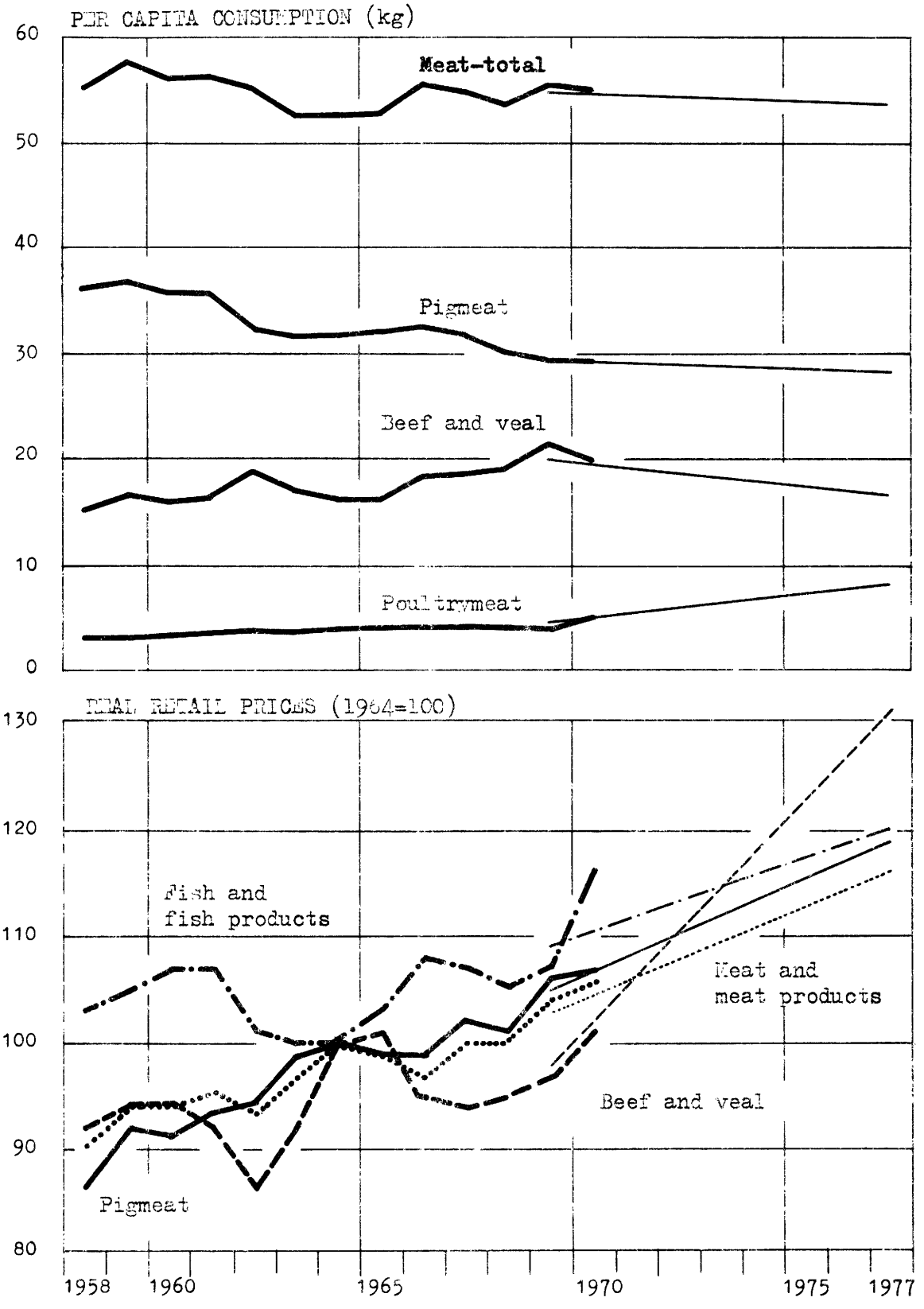
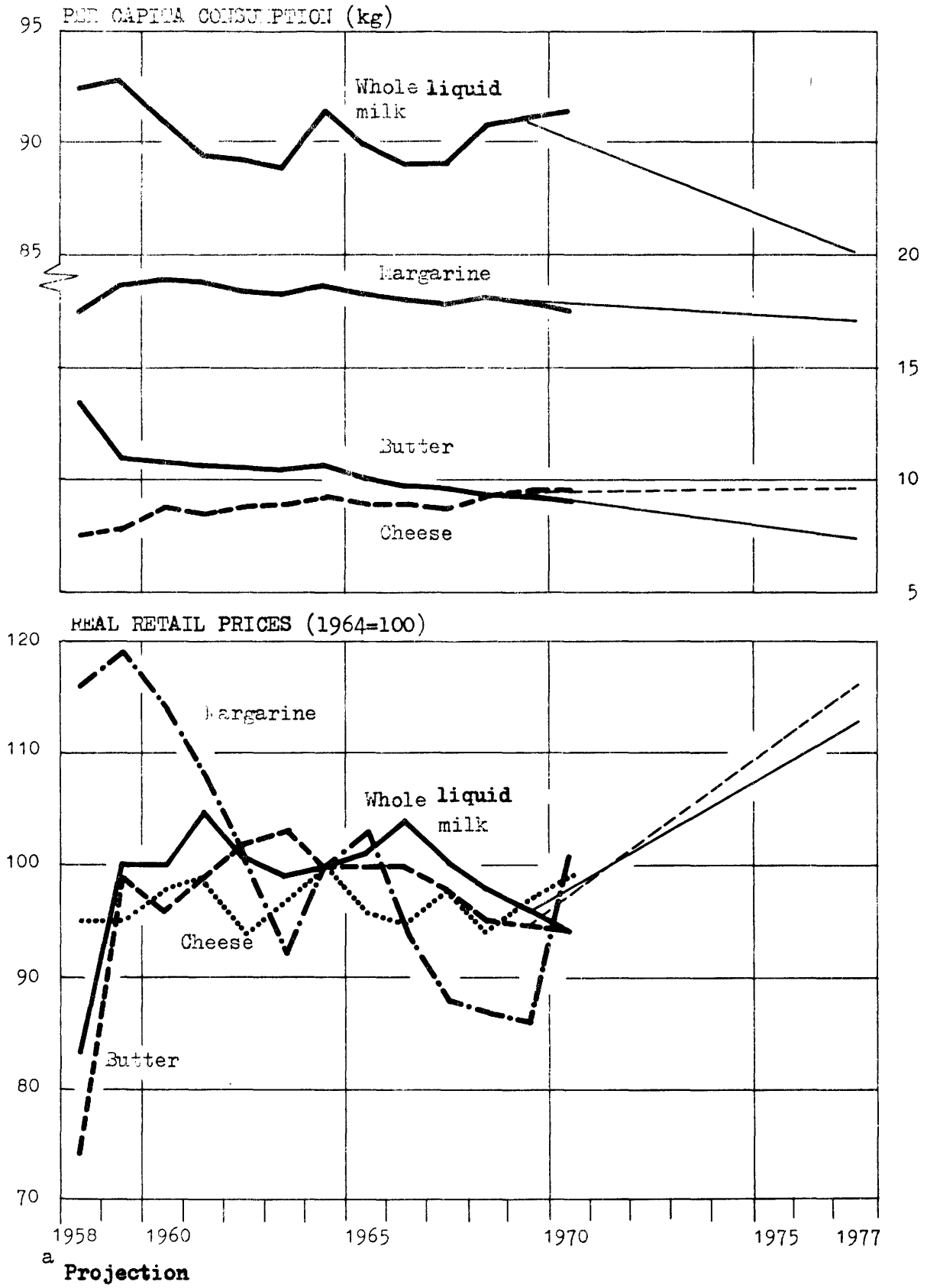
[1] Cf. P.S. Andersen, ..., Projections ..., loc. cit., p. 61 et seq.

Figure 1 - Per capita consumption and real retail prices of beef and veal, pigmeat, poultrymeat and meat-total in Denmark 1958-1970, 1977[a]



[a] Projection

Figure 2 - Per capita consumption and real retail prices of whole liquid milk, butter, margarine and cheese in Denmark 1958-1970, 1977[a]



[a] Projection

is a fall in the real wholesale prices, whereas until now this price has remained static for quite a long period. Only in the case of pigmeat will the previous trend of slowly rising veal prices continue until 1977. This future price trend, brought about by Denmark's accession to the European Communities, will check the consumption of beef, sustain that of pigmeat and promote that of consumption.

In addition, the long-term trend in the real prices of milk and butter will change after the accession of Denmark to the European Communities. Whilst the real prices of these products have until now shown a tendencey to fall, they will in future rise considerably. These increases will hold back the per capita consumption of milk considerably.

By and large, however, no significant changes will be expected in the total amount of food intake. Specifically, the slight downward trend in the daily per capita consumption of calories, fats and proteins will continue (Table 6).

Table 6 - Daily per capita consumption of calories, proteins and fats in Denmark 1958, 1964 - 1970, 1977[a]

	1958	1964	1965	1966	1967	1968	1969	1970	1977[a]
Calory consumption	3 407	3 334	3 322	3 310	3 302	3 269	3 260	3 248	3 146
Protein consumption (g)	85.8	88.2	89.6	89.5	89.5	87.6	87.2	86.3	87.2
Fat consumption (g)	170.1	172.6	171.8	171.8	171.5	169.9	169.0	170.2	166.9

[a] Projection

Source: Tables 25*, 26*, 27*.

II. The production of important agricultural products in Denmark

1. Introductory comments

In recent years almost 90% of the sale proceeds of Danish farming as whole (1970: Dkr 10 800 000) came from the sale of animal products and only about 10 % from the sale of vegetable products. Amongst animal products, income from the sale of pigs and pigmeat (1970: 41% of total revenue) and from sales of cattle, beef and milk products (1970: 40 % of total revenue) are fairly evenly balanced. The only other significant source of income is from sales of eggs and poultry (1970: 5% of total revenue). Vegetable products are largely used as fodder; only a small proportion of production is used directly for human consumption. Consequently, animal production (pigs, cattle, poultry) will first be studied below, and then vegetable production. Based on the proportion of the area used for agriculture the growing of barley clearly predominates; the barley is mainly used as fodder for pigs and poultry. The cultivation of root crops and grass as well as permanent pasture, used chiefly for cattle fodder, is also of importance.

The family business still predominates in Danish farming. On most farms of this type the production of roughage, green forage and cereals, on the one hand, and the keeping of pigs, dairy cows, young cattle and poultry on the other, are related in a carefully balanced business organization which allows the best possible use to be made of crop rotation, family workers and by-products such as skimmed milk, straw and dung. However, tendency towards some degree of specialization is unmistakeable, but as yet specialization is very marked only in the production of poultry for slaughter.

About two-thirds of Danish agricultural products are sold on foreign markets. Hence Danish agricultural production is highly dependent upon conditions on its export markets. Furthermore, Danish agriculture is characterized by its far-reaching organization on cooperative lines. Individual business are brought together in a cooperative network which takes over responsability for the processing and marketing of their products, and for the supply of forage and fertilizers in particular. The aim of this cooperatives is to obtain for their members the best possible prices for their produce and the most advantageous cost prices for raw materials and supplies. This cooperative system with its close interdependence between farmers and cooperatives means that Danish agriculture in general shows a very unified pattern of behaviour and presents a monopolistic front particularly on export markets.

2. Retrospective analysis of the production of important agricultural products in Denmark

a. Pigs

The pig stock and its breakdown into main components are recorded eight times a year in Denmark, i.e. at intervals of about 6 to 7 weeks. Consequently, there is sufficient data available to analyse not only the long-term trend but also the short-term trend in important components of the pig stock. The trend in the pig stock is of particular importance.

As the bulk of Danish pig and pigmeat production is exported (1970: 80%), long-term planning for pig farming in Denmark is very much influenced by the export prospects for live pigs and by the possible marketing outlets for pigmeat abroad. In this connection, the most important market is the U.K. bacon market.

Consequently, the sow stock in Denmark at the beginning of the year increased up to 1965 as long as Danish exports of bacon to the United Kingdom were seen to be capable of expansion. Subsequently , after the United Kingdom fixed a quota for Danish bacon imports, effective from 1 April 1964, and after this quota was no longer increased from 1967/68, the sow stock increased only slightly. The long-term trend in the sow stock, determined by export opportunities, was blurred by considerable short-term fluctuations in this stock, which seem to have been brought about above all by the short-term trend in the ratio of pig prices to feed prices.

In a regression analysis it would, therefore, be reasonable to seek an explanation of the trend in the Danish sow stock in the development of Danish bacon exports to the United Kingdom - in particular, actual exports up to 1964 and those covered by the quota after 1965 - and in the change in the quotient found on dividing the pig price by the price of barley. For the years 1959 to 1971 this gave the following equation:

Period: 1959 - 1971

$$(50)\quad B_S = -1039.9 + \underset{(3.2)}{69.427}\left[\frac{1}{4}\sum_{i=3}^{6}\left(\frac{P_S}{P_G}\right) - \frac{i}{4}\right] + \underset{(5.9)}{4.2459}\, Ex_{BacUK}$$

$R^2 = 0.844$ $\qquad \frac{\hat{\sigma}}{B_S} = 7.2\,\%$ $\qquad$ D.W. = 0.94

Elasticity in relation to the ratio of pig price to barley price : + 0.7

Elasticity in relation to bacon exports to the United Kingdom : + 1.5

B_S	Sow stock at beginning of year
P_S	Producer price for Grade A pigs for slaughter (including equalization payment)
P_G	Purchase price for barley
Ex_{BacUK}	Bacon exports to the United Kingdom - until 1964: actual volume in previous year; from 1965: quota during current quota year (1 April to 31 March).

This equation produces a rather unsatisfactory result in so far as it gives an average elasticity for the sow stock in relation to bacon exports to the United Kingdom which is much greater than 1 and which indicates that the long-term trend in the sow stock depends not only on bacon exports to the United Kingdom but also on overall export developments. The latter were characterized by a steady increase in exports up to 1965, followed by a levelling out in exports. This export trend was included in the estimating equation for the sow stock not directly but indirectly in the form of a trend which breaks off as from the beginning of 1966. This gave the following estimating equation:

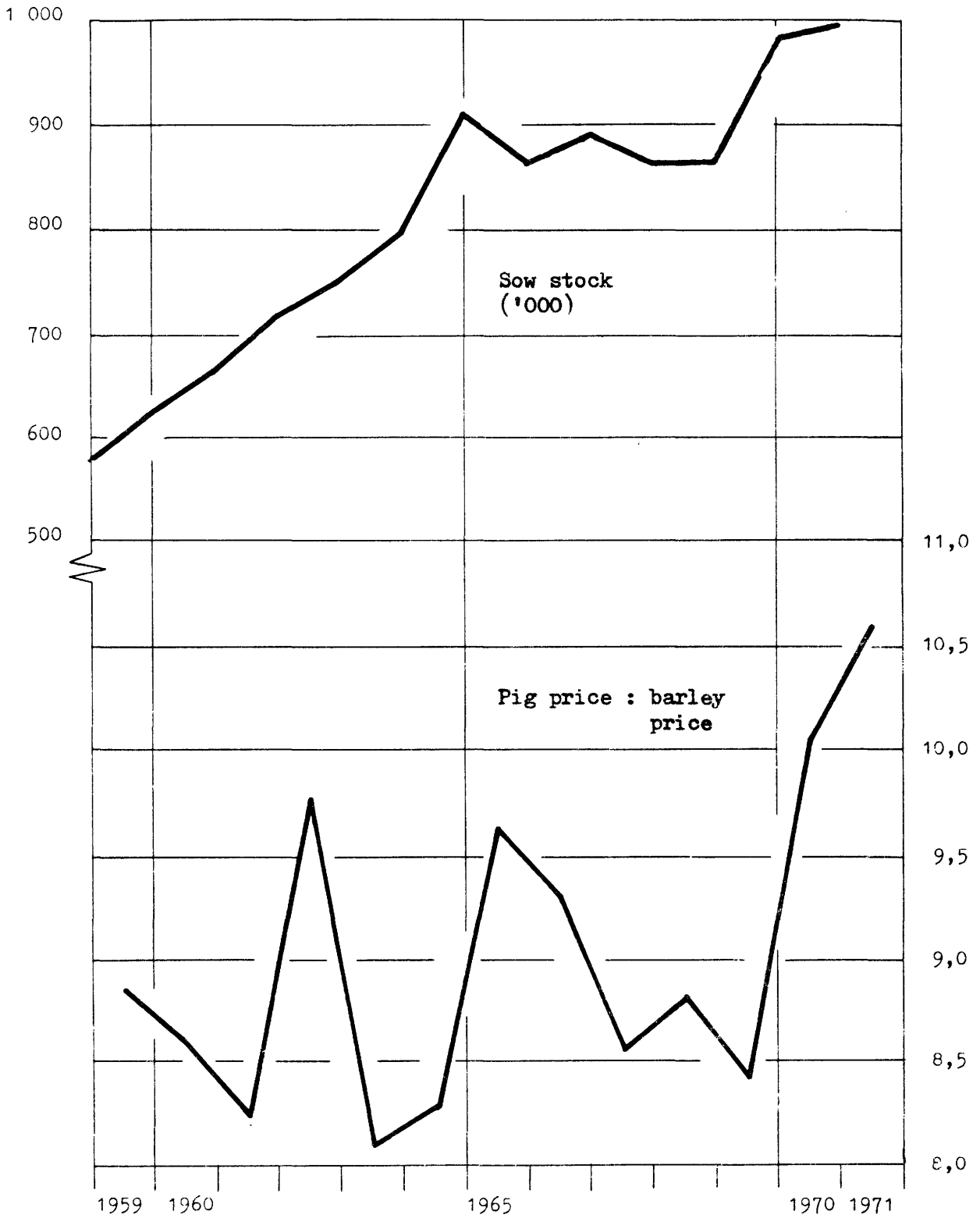
Period: 1959 - 1971

$$(51)\quad B_S = 209.78 + \underset{(3.7)}{37.067}\left[\frac{1}{4}\sum_{i=3}^{6}\left(\frac{P_S}{P_G}\right) - \frac{1}{4}\right] + \underset{(12.2)}{45.193}\ t - \underset{(4.9)}{32.822}\ t_1$$

$R^2 = 0.979$ $\qquad \frac{\hat{\sigma}}{B_S} = 2.8\ \%$ $\qquad$ D.W. = 2.23

Elasticity in relation to the ratio of pig price to barley price: + 0.4

Figure 3 - Sow stock at the beginning of the year and the ratio of pig price to barley price 1959 - 1971



B_S Sow stock at beginning of year t

P_S Producer price for Grade A pigs (including equalization payment)

P_G Purchase price for barley

t Trend (1959 = 1, ..., 1971 = 13)

t_1 Trend correction (1959-1965 = 0, 1966 = 1, ..., 1971 = 6); i.e. from 1966 the trend no longer shows an annual increase of 45.193, but only of 45.193 - 32.822 = 12.371.

A similar calculation for the sow stock at the beginning of each quarter showed even more clearly how significant the ration of pig price to barley price was for the short-term fluctuation in the sow stock:

Period: 1959:1 - 1971:2

$$(52)\quad B_S = 159.63 + \underset{(7.0)}{41.190}\left[\frac{1}{4}\sum_{i=3}^{6}\left(\frac{P_S}{P_G}\right)_{-\frac{i}{4}}\right] + \underset{(26.5)}{11.713}\,t - \underset{(11.5)}{12.443}\,t_1$$

$$+ \underset{(2.6)}{26.350}\,S_2 + \underset{(4.3)}{44.635}\,S_3 + \underset{(3.1)}{32.111}\,S_4$$

$R^2 = 0.965$ $\qquad \frac{\hat{\sigma}}{B_S} = 3.3\,\%$ $\qquad$ D.W. = 0.77

Elasticity in relation to the ratio of pig price to barley price : + 0.45

B_S Sow stock at beginning of quarter t

P_S Producer price for Grade A pigs (including equalization payment)

P_G Purchase price for barley

t Trend (1958: 1 = 1, ..., 1972: 2 = 54)

t_1 Trend correction (1958: 1 - 1965: 4 = 0, 1966: 1 = 1, ..., 1971: 2 = 22); i.e. from 1966: 1 the trend no longer shows a rise of 11.713 per quarter, but a slight fall of 11.713 - 12.443 = -0.73.

S_2, S_3, S_4 (0.1)- variable whose regression coefficients give the average change, not accounted for by the other exogenous variables, in the sow stock at the beginning of the 2nd, 3rd and 4th quarters compared with the stock at the beginning of the year[1]:

$$S_2 = \begin{cases} 1 \text{ during 2nd quarter} \\ 0 \text{ during other quarters} \end{cases}$$

$$S_3 = \begin{cases} 1 \text{ during 3rd quarter} \\ 0 \text{ during other quarters} \end{cases}$$

$$S_4 = \begin{cases} 1 \text{ during 4th quarter} \\ 0 \text{ during other quarters.} \end{cases}$$

The number of pigs slaughtered and exports of live pigs for the years 1958 to 1970 were not examined by regression analysis; however, their relationship to the corresponding numbers at the beginning of the year was considered (Table 29*). It was found that the annual loss of sows for breeding and boars as a result of slaughter and the export of live animals taken together accounted on average for almost two-thirds of the initial number of sows and boars in the first few years up to 1961 and for almost half that number as of 1963. The latter figure indicates that on average sows are slaughtered after four litters. It was also found that the number of fat pigs slaughtered in the first few years up to 1961 averaged fourteen times the sow stock at the beginning of the year. In subsequent years, however, this ratio declined almost continuously. In 1970 the number of fat pigs slaughtered amounted to only eleven times the sow stock. The stock statistics show how this surprising decrease came about. The number of piglets per sow in pig remained almost constant at between 8.5 and 8.7 over the entire period; however, the number of store pigs per sow in pig three months previously, which had remained constant until 1961, decreased almost continuously from 1962, averaging only 6.5.

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[1] See H. Gollnick, Einführung in die Ökonometrie. Stuttgart, 1968, p. 219 et seq.

The various weight categories fell accordingly : pigs (35 - 60 kg) per sow in pig three months previously, and fat pigs (over 60 kg) per sow in pig six months previously (Table 28*).

b. Cattle

Catlle farming, which is carried out throughout the year, is the main stay of many small and medium-sized businesses, even though thorough calculations show it to be unprofitable.

The cattle stock in Denmark showed a steady increase until 1962; since then it has declined constantly. The increase until 1962 was largely explained by more intensified fattening of calves and young cattle; the number of dairy cows showed a slight increase only intermittently. The downward trend since 1962 applies uniformly to the numbers of dairy cows, fatstock, heifers and calves. Following the change in fattening practices, the number of dairy cows is again the most important factor determining the size of the cattle herd and its components, for the supply of milk and milk products, and cattle exports and slaughterings.

The tendency for milk yield per cow to increase whilst domestic sales of milk and milk products at prices ensuring cost recovery remained constant and opportunities for exporting Danish butter at satisfactory prices diminished, was primarily responsible for the downward trend in the stock of dairy cows. In particular, it was Danish butter exports to the United Kingdom that levelled out, since to cover rising costs the Danish Butter Export Board fixed prices at such a level that the margin between Danish butter and New Zealand butter widened, thereby diminishing the competitive position of Danish butter on the U.K. market.

Given the dominant position of butter exports in relation to Danish cattle farming, it was fairly easy to calculate the stock of dairy cows at the beginning of each of the years from 1959 to 1972 in a regression equation in which annual butter exports for a period ending one and a half years previously were used as the only explanatory variable. These export figures were then converted into the number of dairy cows whose milk was required to produce the amount of butter exported.

Period: 1958 - 1972 (beginning of year)

$$(53)\quad B_M = 433.77 + \underset{(6.2)}{1.5973} \sum_{i=7}^{10} Ex_{Bu_{-i}}$$

$$R^2 = 0.750 \qquad \frac{\hat{6}}{B_M} = 4.3\ \% \qquad D.W. = 1.30$$

Elasticity of the stock of dairy cows in relation to butter exports: + 0.7

B_M Dairy cow stock at beginning of year

Ex_{Bu} Quarterly butter exports (converted into number of dairy cows whose milk was required to produce the amount of butter exported).

However, this approach meant that no variable expressing the competition between pig and cattle farming could successfully be included in the equation. Hence, in a further attempt to express the downward trend in the dairy cow stock a trend was included rather than the similar downward trend in butter exports which, however, only describes but does not explain the fall in dairy cow numbers. Nevertheless, once this trend was included, the shift in profitability between cattle and pig keeping could also be included in the equation.

This shift is reflected, in particular, in the change in the quotient found on dividing the milk price/fodder concentrate ratio by the pig price/barley price ratio. Now the milk price/oil cake price ratio hardly shifted during the period with the result that the above quotient changes particularly when the pig price/barley price ratio shifts appreciably. Hence, only this pig price/barley price ratio, with a delay of 18 months, was included in the equation for the dairy cow stock. This gave the following equation for the milk cow stock at the beginning of the years 1958-1972:

Period: 1956 - 1972 (beginning of year)

$$(54)\quad B_M = 1755.3 - \underset{(6.5)}{22.324}\, t - \underset{(1.5)}{23.190}\left[\frac{1}{4}\sum_{i=7}^{10}\left(\frac{P_S}{P_G}\right)_{-\frac{i}{4}}\right]$$

$R^2 = 0.896 \qquad \frac{\hat{\sigma}}{B_M} = 2.9\,\% \qquad D.W. = 0.95$

Elasticity of the dairy cow stock in relation to pig price/barley price ratio: - 0.2

B_M Dairy cow stock at beginning of year
t Trend (1958=1, ..., 1972=15)
P_S Producer price for Grade A pigs for slaughter (including equalization payment)
P_G Purchase price for barley.

When assessed against the coefficient of accuracy R^2, equation (54) gives a much better explanation than equation (53). But the coefficient R^2 can still be increased considerably as is shown below:

Period: 1958 - 1972 (beginning of year)

$$(55)\quad B_M = 1405.1 - \underset{(9.6)}{19.328}\, t - \underset{(4.9)}{44.515}\, t_1 + \underset{(2.2)}{215.10} \left[\frac{1}{4} \sum_{i=7}^{10} \left(\frac{P_F}{P_G}\right) - \frac{i}{4} \right]$$

$R^2 = 0.960$ $\qquad \frac{\hat{\sigma}}{B_M} = 1.7\,\%$ $\qquad$ D.W. = 1.22

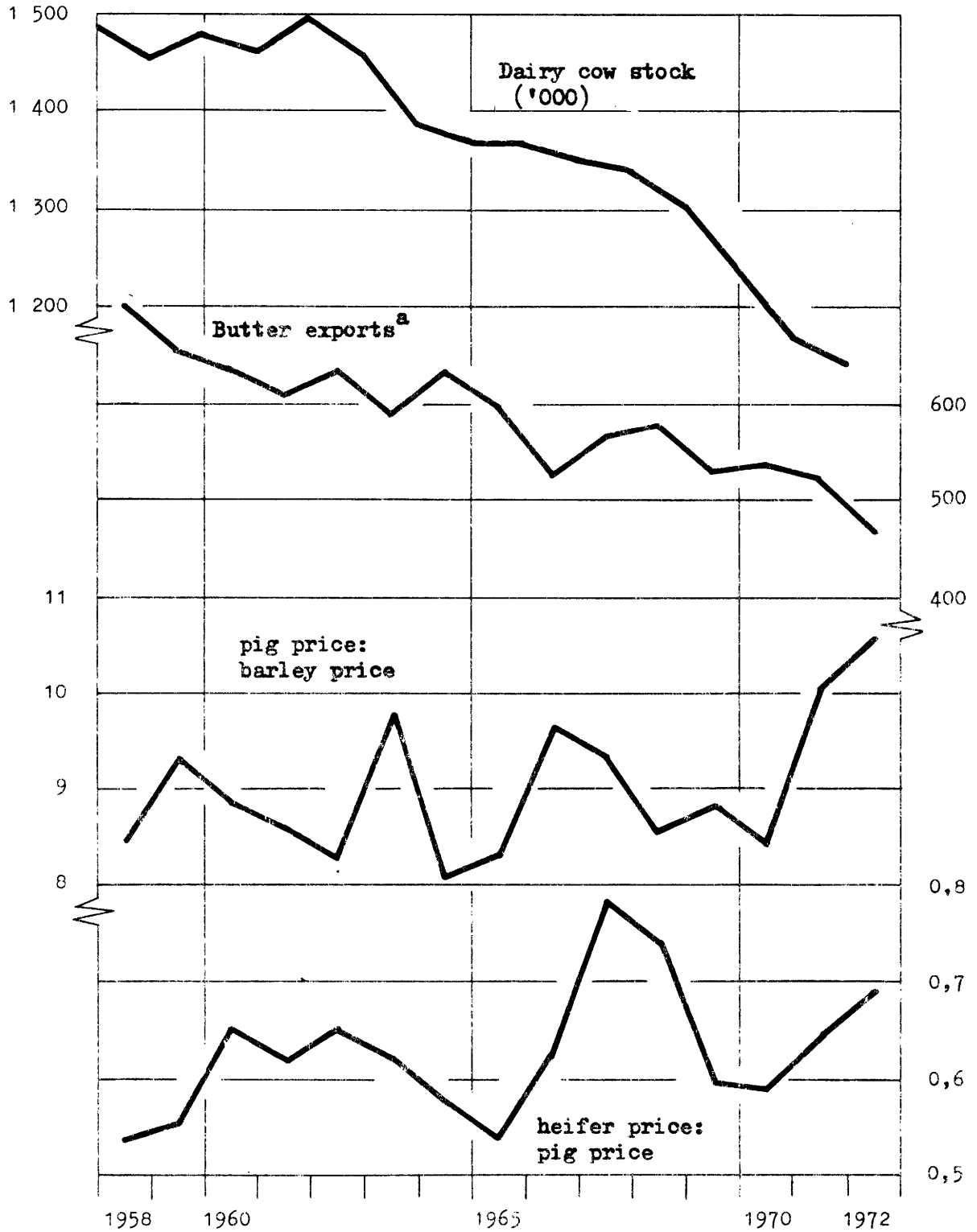
Elasticity of the dairy cow stock in relation to the heifer price/pig price ratio: + 0.1

B_M	Dairy cow stock at beginning of year
t	Trend (1958=1, ..., 1972=15)
t_1	Trend correction (1958-1969=0, 1970=1, ..., 1972=3)
P_F	Producer for Grade 1 heifers (including equalization payment)
P_S	Producer price for Grade A pigs for slaughter (including equalization payment).

This indicates that the contraction in dairy cow farming is due to the factors mentioned above, namely an upward trend in milk yield per cow together with a downward trend in market expectations for milk products, and that the temporary speeding up of this contraction is due to the temporarily accelerated fall in butter exports and to the temporary deterioration in the profitability of milk production compared with that of pig keeping. The short-term fluctuations in the trend depend, however, solely on competition between beef and pigmeat production. For this it was assumed that feed costs developed evenly in both sectors, which is surely valid only with certain reservations.

Therefore, the three equations (53) to (55) each illustrate aspects of the situation which, because of the uniformity of the time series of the explanatory variables, could not be expressed together in one equation.

Figure 4 - Dairy cow stock at the beginning of the year and its determining factors 1958 - 1972



[a]Converted into number of dairy cows.

As later considerations in respect of calf exports and slaughterings are partly based on the mid-year dairy cow stock, all three equations were also applied to the mid-year dairy cow stock, using the same explanatory variables - the time lags were, therefore, also shortened by six months. This shortening of the time lags would seem to be appropriate since calving is concentrated in the spring and thus decisions as to how many heufers are to be covered are taken in the middle of the previous year. This gave the following equations:

Period: 1957 - 1971 (mid-year)

(53a) $B'_M = 441.08 + \underset{(5.8)}{1.5572} \sum_{i=5}^{8} Ex_{Bu_{-i}}$

$R^2 = 0.718$ $\qquad \frac{\hat{\sigma}}{B'_M} = 4.6\ \%$ $\qquad$ D.W. = 0.91

(54a) $B'_M = 1648.4 - \underset{(6.1)}{19.987}\ t - \underset{(1.9)}{37.402} \left[\frac{1}{4} \sum_{i=5}^{8} \left(\frac{P_S}{P_G}\right) - \frac{i}{4} \right]$

$R^2 = 0.837$ $\qquad \frac{\hat{\sigma}}{B'_M} = 3.7\ \%$ $\qquad$ D.W. = 0.70

(55a) $B'_M = 1406.3 - \underset{(5.2)}{15.390}\ t - \underset{(4.5)}{60.390}\ t_1 + \underset{(1.0)}{147.64} \left[\frac{1}{4} \sum_{i=5}^{8} \left(\frac{P_F}{P_S}\right) - \frac{i}{4} \right]$

$R^2 = 0.931$ $\qquad \frac{\hat{\sigma}}{B'_M} = 2.5\ \%$ $\qquad$ D.W. = 0.69

B'_M Mid-year dairy cow stock

t Trend (1957=1, ..., 1971=15)

t_1 Trend correction (1957 - 1968 = 0, 1969 =1, ..., 1971 = 3).

Equations (53a) to (55a) give rather worse adjustments than the equivalent equations (53) to (55). Yet, their results are naturally by and large very similar to those obtained with equations (53) to (55).

The numbers of bulls, steers, heifers and calves were not examined by means of a regression analysis. It may be assumed that long-term developments in these numbers are determined chiefly by the dairy cow stock and by fattening practices. This can clearly be seen from the following relatively steady ratios, number of calves at beginning of the year, expressed as a percentage of the dairy cow stock in the middle of the previous year (divided into bull calves and heifer calves from 1963 onwards) and the number of heifers at the beginning of the year expressed as a percentage of the dairy cow stock at the beginning of the previous year. However, decisions taken on the basis of prices having no connection with the dairy cow stock will also influence the short-term stock trend. It is chiefly prices that determine whether the fattening of calves is worthwhile, how many young cattle are to be fattened and how many heifers are to be added to the dairy cow stock. It is very clear that the higher the price for heifers during the previous year, the higher are the quotients given above. In the same way the stocks of steers and bulls respectively at the beginning of the year, expressed as a percentage of the dairy cow stock at the beginning of the previous year, react very definitely to past price fluctuations (Table 30*). This dependence of the numbers of calves, heifers, steers and bulls on prices will not, however, be discussed here but in connection with calf exports and slaughterings since the utilization of calves determines those numbers.

For live exports and cattle slaughterings Danish statistics distinguish only between animals over 1 year old or adult animals, and calves. They make a further distinction between slaughterings of fat calves and those of suckling calves, but it is not clear whether all the animals designated as calves are less than one year old.

For all animals designated as calves, including animals over one year old, live exports, slaughterings in abattoirs, and (estimated) farm slaughterings will, in the following analyses, be combined to give under total market supply (= outflow). These analyses refer to farm years and not calendar years, since the statistics for farm years reflect the processes involved in cattle farming better than the statistics for calendar years. In this connection we have deliberately allowed for the fact that, due to the lack of data, the investigation period has been shortened to 1960/61 - 1970/71.

The investigation period was characterized by a downward trend in live exports and an upward trend in slaughterings. Furthermore, there was a recognizable trend towards a lengthening of the fattening period for calves because the ratio of meat prices to feed costs shifted in favour of meat prices. Hence, the tendency was for slaughterings of suckling calves to fall whilst those of fat calves increased.

If the outflow of calves due to live exports, slaughterings in abattoirs and farm slaughterings during a given farm year, expressed as a percentage of the dairy cow stock at the beginning of the farm year falling in the middle of the calendar year in which that farm year begins, is examined, we see that this percentage tended to increase. In the short term it fluctuated appreciably due to its close relationship with the price for heifers:

Period: 1960/61 - 1970/71

$$(56)\quad \frac{(Ex+S)_K}{B'_K} \cdot 100 = 55.412 + \underset{(7.7)}{1.9446}\ t - \underset{(4.6)}{0.0653}\ P_F$$

$R^2 = 0.893$ $\quad \hat{\sigma} = 1.7$ $\quad D... = 0.76$

Elasticity in relation to heifer price: - 0.4

$(Ex+S)_K$	Live exports and slaughterings of calves
B'_M	Dairy cow stock at beginning of the farm year (falling in the middle of the calendar year in which the farm year begins)
t	Trend (1960/61 = 1, ..., 1970/71 = 11)
P_F	Producer price for Grade 1 heifers (including equalization payment).

In this form equation (56) still appears unsatisfactory. Since slaughtered fat calves are destined primarily for the Italian market, equation (56) should also allow for this particular fact. This would require a detailed analysis of the total demand for beef and veal in Italy, the supply of beef and veal in Italy, the total import requirements for beef and veal in Italy, and the proportion of these imports met by Denmark and its chief competitors (the Netherlands). Understandably, no such analysis has been attempted here as it would fall outside the scope of this study.

The live exports of cattle more than 1 year old and the slaughterings of adult cattle refer particularly to fat bulls and steers, cows removed from the dairy cow stock and heifers not required for the dairy cow stock. For this reason, the total of live exports of animals for slaughter more than one year old, slaughterings of adult animals and live exports of breeding animals in a given year - and in particular the annual changes in these figures - can be satisfactorily deduced from the estimated number of calves born during the previous year, minus the number of calves exported live or slaughtered during the previous year, and minus changes in the numbers of bulls, steers, dairy cows and heifers during the current year (Table 7). In this case, the calving rate was taken as 0.99, since the heifer calf stock at the beginning of the year frequently accounted for 49.5 % of the dairy cow stock in the middle of the previous year and since the proportion of sexes at birth is 50 : 50. In fact, for every year

Table 7 - Estimated live exports of cattle more than one year old and slaughterings of adult cattle 1961/62 - 1970/71 ('000 head)

	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71
Estimated number of calves born in previous year[a]	1424	1478	1448	1394	1356	1337	1337	1316	1279	1221
Previous year's live exports and slaughterings of calves	627	681	680	625	574	588	665	695	693	662
Changes in current year in the stock of bulls	+ 7	- 42	- 8	+ 13	+ 14	- 20	- 16	- 7	- 1	+ 2
steers	+21	+ 7	-16	- 5	+ 1	- 3	- 11	-14	- 5	- 4
dairy cows	-30	- 55	-38	- 20	0	- 21	- 37	-59	-80	-48
heifers	+ 4	- 46	- 3	+ 23	- 4	+ 8	- 31	-24	-44	-29
= Estimated supply of cattle over one year old	795	933	833	758	771	785	767	725	716	638
Live exports of animals for slaughter over one year old + slaughterings of adult animals + live exports of animals for breeding	803	889	759	637	681	722	706	666	639	577
Difference	- 8	44	74	121	90	63	61	59	77	61

[a] 0,99 x dairy cow stock at beginning of period t-1/t (mid-year t-1)

Source : Tables 30* and 31*, and own calculations.

except 1960/61 the supply of cattle over one year old estimated in this way is far greater than the total of actual live exports of animals for slaughter over one year old, of slaughterings of adult animals and of live exports of animals for breeding. This is probably to be explained by the fact that many stock departures were not included in the statistics and that the rough estimates of farm slaughterings were generally too low.

c. Poultry

A certain structural change occurred in Danish poultry-keeping in the 1960's. Whereas up to the end of the 1950's egg production clearly predominated and broiler production was of only secondary importance, egg and broiler production are now more or less balanced as far as income from them is concerned. This change was the result of the structural difference between egg and broiler production. Whereas egg production was mainly a small-scale enterprise (in 1970 70% of hens were in flocks of less than 1'000), broiler production was predominantly practised on comparatively few large farms (in 1970 70% of broilers under six months old were on farms with more than 10 000 birds). It is true that price trends for eggs and for broilers were equally unfavourable, but for a long time this was less noticeable in broiler production because considerable rationalisation benefits accrued from the changeover to larger production units.

The number of hens in Denmark, which at 10 - 11 000 000, remained fairly constant, in the 1950's, started to fall appreciably in the early 1960's and by 1970 was only 6 300 000 (41.5 % down on 1959). This fall was a result of the drastic reduction in the outlets for egg exports in EEC countries, of which Germany was the largest customer. An increase in the laying yield can be ruled out as an additional reason since the yield - measured by the annual egg production per hen shown in the official

statistics for the middle of the year in question - levelled out in 1959 and then declined again until the middle of the 1960's, becoming stable again only in 1967 to 1970 at 13.6 kg per hen, which is certainly higher than the average for the years 1964 to 1966 (13.0 kg per hen) but considerably below the average for 1958 - 1960 (14.5 kg per hen). At least one of the reasons for this unexpected trend in the computed laying yield could well be the inadequate recording of egg production in the official statistics.

In the second half of the 1960's, the export prices for eggs were generally so low that they did not cover production costs. Egg production as a whole was only profitable because of the high prices on the domestic market.

The number of growing hens fall at an even greater rate than the number of hens. Whereas, at the beginning of the 1960's, the number of growing hens was only slightly lower, than the number of hens (about 90 %), it has dropped since the mid-1960's to about two-thirds of the number of hens. The decline in this ratio and the above trend in the laying yield per hen could indicate that in the early 1960's there was extensive regeneration of the flock and that since then this process has not only been halted but in some cases reversed.

Broiler production started to gain in importance only in the late 1950's in Denmark. Until then only male chicks obtained in the course of rearing laying hens had been slaughtered. Only after came a changeover to systematic poultry fattening. As a result, the number of broilers rose

considerably until the early 1960's. Since then the number of broilers has also declined. This is partly the result of the reduced export outlets for poultrymeat to EEC countries following the entry into force of the EEC organization of the market in poultry-meat , since the Federal Republic of Germany was formerly the main customer for Danish poultry exports. The loss of markets in EEC countries has not been fully offset by increased sales to other countries. Above all, the income from broilers on foreign markets in general took a very unsatisfactory turn so that producers had sometimes to be granted substantial equalization payments for exports, which were made possible mainly by increasing domestic prices.

The number of broilers and hens slaughtered in slaughterhouses in one year - this is the only figure recorded in the official statistics - shows only a loose correlation with the corresponding numbers of broilers and hens in the middle of the year. However, it does show that the number of broilers slaughtered as a percentage of the total number of broilers in the middle of the year increased substantially. This reflects mainly the reduction in fattening time brought about by the changeover to broiler production.

Because of the short time required to fatten broilers, a turnover in their number occurs several times a year. Consequently, the importance of the above ratio for an analysis of the supply of poultrymeat lies not in the fact that the number of broilers in the middle of the year determines the supply of poultrymeat during a given year, as is usual, but, on the contrary, in the fact that it permits conclusions about the number of broilers to be drawn from the supply of poultrymeat.

The short production time allows broiler producers to adapt very quickly to trends in poultrymeat prices and feed costs. Consequently, the number of broilers slaughtered (= supply) could presumably be accounted for satisfactorily by the short-term development of the quotient found on dividing the producer price for broilers by feed costs. Unfortunately, no separate price for broiler feed was available to us. The quotient found on dividing the producer price for broilers by the purchase price for barley naturally proved not to be sufficiently informative, as a comparison of the number of broilers slaughtered quarterly and the quarterly trend in this quotient showed. Consequently an econometric analysis of the number of broilers slaughtered was not possible.

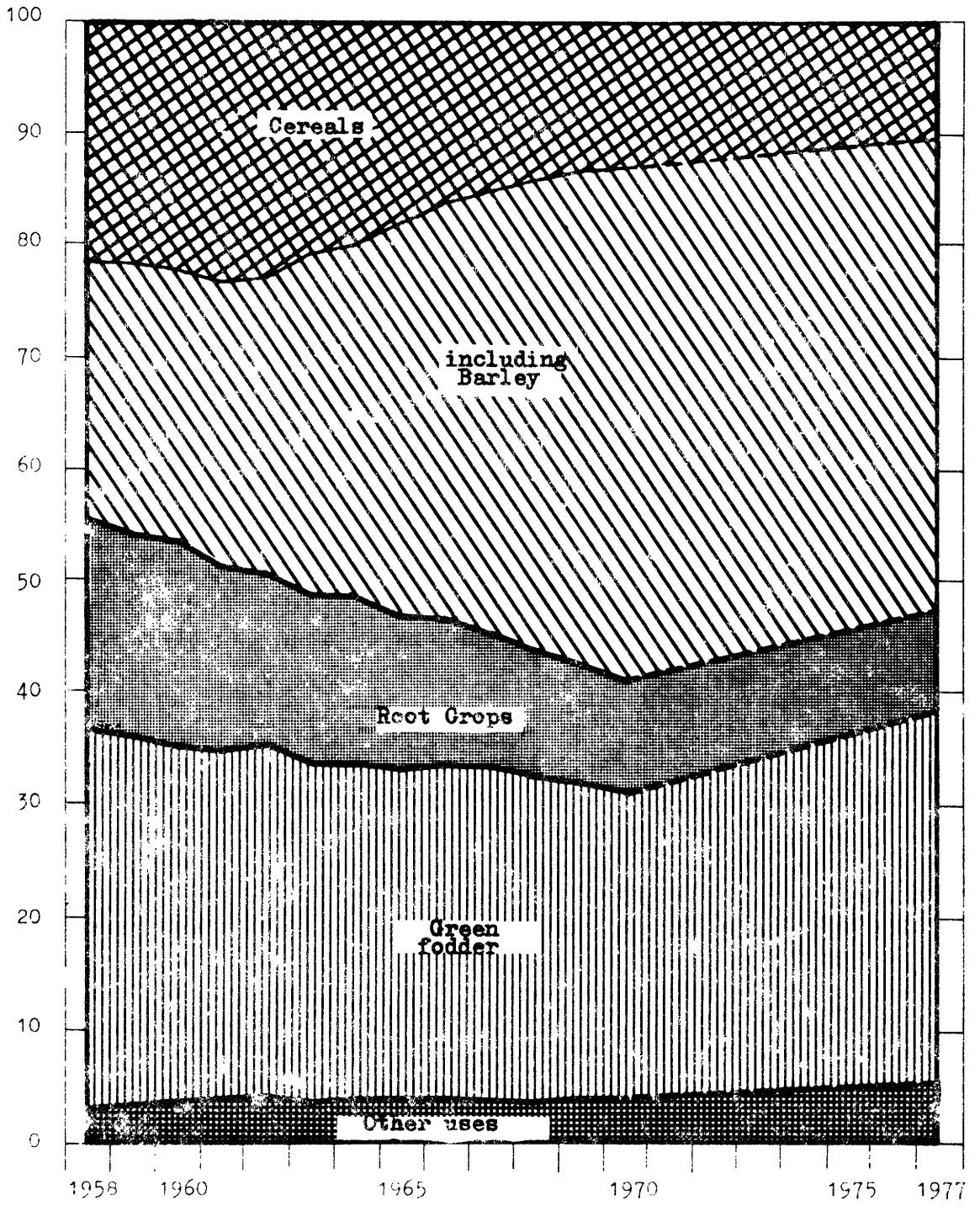
The number of hens slaughtered as a percentage of the number of hens in the middle of the year shows a clear downward trend. This decline can again be accounted for by the fact that in the early 1960's the flock of hens became very much younger and that a greater proportion of growing hens were slaughtered before becoming hens. As this proportion now stands at just under 30 %, it is safe to say that the number of hens slaughtered in slaughterhouses greatly underestimates the supply of boiling fowl. In Denmark laying hens are generally slaughtered after 18 months, when their laying yield has passed its peak. This would mean that a turnover in the number of hens would have to occur once a year. In other words, in addition to the number slaughtered in slaughterhouses and recorded in the official statistics, about twice as many birds must be slaughtered by producers. Even though one must allow for the fact that some of the laying hens killed are probably not used for poultrymeat production, it must be assumed that, as far as the supply of boiling fowl in a given year is concerned, the number of laying hens in the middle of the year is more informative than the number of hens slaughtered in slaughterhouses.

d. Crop production

Crop production in Denmark serves primarily to provide fodder for domestic cattle and pig farming. In addition, it provides home-grown food for the Danish people, mainly in the form of cereals, sugar, potatoes and various types of fruit and vegetables, if one disregards the need for imports of generally small amounts of qualities and types of products not available or not available in sufficient quantities in Denmark. In addition, there is occasionally an export surplus which, in comparison with total production, is generally not very significant. A feature of crop production is that, in general, the yields per unit area (in tons or fodder units) are tending to increase slightly, but sometimes undergo considerable fluctuations depending on the weather.

The agricultural area in Denmark is tending to decline slowly, involving considerable shifts in the cultivation structure. As crop production in Denmark serves primarily to provide fodder for domestic cattle and pig farming, the varying trends in cattle and pig farming are reflected most of all in the breakdown of crops grown. The pig stock rose sharply until 1965, then remained constant for some time and only in recent years started to increase slightly. However, the cattle stock increased slightly until 1962, and then declined at first slowly and from 1969 more rapidly. As a result, there has been a very marked expansion of fodder grain cultivation (barley) and a reduction in forage root crop cultivation and in permanent pastureland and areas sown with grass and clover mixtures. Labour and mechanization problems, and rising yields per hectare accelerated the reduction in the area under root crops for fodder, which, expressed as a percentage, declined very much more than the area under permanent pasture and grass and clover mixtures. The importance of the latter in crop rotation helped to restrict this decline.

Figure 5 - Agricultural area in Denmark 1958-1970, 1977[a] (%)



[a] Projection.

Meanwhile, cereal cultivation accounted for 59% (1970) of the agricultural area (1958: only 45 %), while the figure for the cultivation of root crops has fallen to 10% (1958: still 19%). Permanent pastureland and green fodder together account for almost all the remaining agricultural area (27%, compared with 33% in 1958). The remaining 4% are used for the production of pulses, seeds and horticultural products.

The breakdown of the area under cereals into wheat, rye, barley, oats and meslin has, since the introduction of the market organisation in 1958 and apart from the strong expansionary trend in fodder barley cultivation, been determined mainly by the relationship between the minimum import prices for the different types of fodder grain and the minimum producer prices for bread grain (until 1965/66) and by the compulsory milling of a proportion of Danish bread grain. The minimum producer prices for bread grain led to such a great expansion in wheat and rye cultivation in the early 1960's that serious marketing difficulties arose and considerable quantities of wheat and above all rye were used as feed. Consequently, the minimum producer prices for bread grain were abolished at the beginning of the 1966/67 farm year so that since then only the minimum import prices have been applicable to imports of wheat and rye for feed purposes. Since that time rye has been produced in Denmark almost exclusively for domestic human consumption at home since with the minimum import prices set at the same level for all types of fodder grain since 1965/66 the cultivation of rye for feed is not worthwhile because of its lower yield per hectare compared with other cereals. Cultivation of wheat has also declined slightly since, although yields per hectare of winter wheat are considerably higher, and of spring wheat not very much lower, than that of barley, which is the most important fodder grain. Since the minimum import prices are the same for all types of fodder grain, the cultivation of meslin has fallen drastically. As in the case of rye, this can be accounted for by the fact that cultivation of this crop is

not worthwhile when the minimum prices are the same for all types of fodder grain, because it has a comparatively low yield per hectare. Only oats, an important component of compound feedingstuffs, continue to be grown extensively so that the area under oats remains fairly constant. The cultivation of barley, which has very high and stable yields per hectare, predominates. The rapid expansion of barley growing made Denmark a net exporter of cereals in 1968/69 and 1969/70, although until then it had traditionally been a net importer of cereals. To overcome this surplus problem, the minimum import price for all fodder grains for 1969/70 and 1970/71 was reduced by Dkr 1.

There is a close link between the marketing of pigmeat and the fodder grain price policy. When the marketing outlets for pigmeat ceased to expand in the mid-1960's, the minimum import price for barley in particular was raised considerably to make pig fattening more expensive and keep it within certain limits, a measure that proved successful. The cultivation of barley, which was stimulated by the cereal price policy created no marketing problems as long as Denmark was not completely self-sufficient in fodder grain. This policy started to create problems only when complete self-sufficiency was attained. The reduction in the minimum import price for fodder grain made at that time could be sufficicient to solve the problem of the surplus of fodder grain. However, the reduction in the price of fodder could stimulate the production of pigs to such an extent that new marketing problems would arise in this sector in the short term.

In addition to root crops, potato growing is also declining rapidly. This reflects in addition to the slow decrease in the human consumption of potatoes, the sharp decline in their use as feed for pigs mainly for reasons of labour and mechanization. There is also a tendency for yields to increase.

The area under sugar beet for sugar production underwent considerable temporary fluctuation. The Ministry of Trade guaranteed the sugar refineries a certain ex-refinery price and producers a certain producer price. This guarantee applied up to 1966 for the sugar beet harvested from an area fixed by the Ministry of Trade in such a way that with a normal harvest the domestic consumption of suger would be fully covered and that in addition there would be sufficient sugar available for export if the trend in the world market price for sugar indicated that exports were profitable. Some sugar beet was also exported. That harvested from areas exceeding the contractual area had to be sold at the world market price so that there was only an incentive to exceed the contractual areas by any significant amount when the world market price was favourable (1963/64, 1964/65). Since 1967 the guaranteed prices have applied to a fixed volume of sugar, the level of which approximates to that of domestic consumption given the unsatisfactory world marked price for sugar.

As domestic sugar consumption in Denmark is fairly constant, these market regulations, along with the upward trend in yields per hectare, resulted in an underlying tendency for the area under sugar beet for sugar production to fall slightly. This tendency is only temporarily interrupted by a substantial expansion in the area under sugar beet when the world market price for sugar is such as to make the export of sugar or sugar beet worthwhile.

3. Producer price hypotheses for selected agricultural products in Denmark for 1977/78

The producer price hypotheses for selected agricultural products in Denmark in 1977/78 are shown in Table 8. The considerations on which these hypotheses are based have already been set out in detail in the introduction and need not be repeated here. Prices expressed in units of account (u.a.) in the introduction were converted into Danish currency at the rate: 1 u.a. = Dkr 7.5783.

It emerges that for all important products Danish agriculture can count on albeit widely divergent increases in producer prices in 1977/78 compared to prices in 1969/70. These increases in producer prices will be small for pigs for slaughter, broilers, eggs and sugar beet, for which average annual growth rates in the producer prices of only 1.5% to 3.5% can be expected. Moderate increases in producer prices can be expected for cereals and rape, for which the average annual growth rates will be between 5 and 7%. The largest increases are likely to occur in the producer prices for cattle, milk and butter, with annual average growth rates of 10% to 11%.

These average annual rates of increase in producer selling prices between 1969/70 and 1977/78 may only with caution be taken as a measure of the annual price adjustments that Danish agriculture can expect after Denmark's accession to the European Community. The correct base year for this type of analysis would not be 1969/70, but the 1971/72 farm year, or the 1972 calendar year and then only if certain increases in producer selling prices have not already taken place in anticipation of Denmark's entry into the European Community.

Table 8 - Producer prices of selected agricultural products in Denmark, 1969/70, 1977/78[a]

Products	Unit	Explanation of price 1969/70	Price 1969/70	Explanation of price 1977/78	Price 1977/78	Price change 1977/78 as against 1969/70 (%)	Annual average rate of price change between 1969/70 and 1977/78 (%)
Pigs for slaughter	øre/kg slaughter weight	Grade A pigs incl. equalisation payment and additional payment	564	Basic price	688	+ 22	+ 2.5
Cattle	øre/kg live weight	Average of prices for Grade 1 heifers and Grade 1 young cows	338	Guide price	716	+112	+ 9.8
Broilers	øre/kg slaughter weight	Producer price (incl. equalisation payment), extra grade	316	Sluice-gate price for dead poultry (plucked and drawn, without heads and feet but with hearts livers & gizzards) multiplied by factor 0.7	424	+ 34	+ 3.7
Eggs	øre/kg	Export price + equalisation payment + additional payment	356	Sluice-gate price	415	+ 17	+ 1.9
Whole milk	øre/kg	Dairy farm price on basis of weekly price for butter, for milk with a fat content of 4.2 %	53	Target price for whole milk with a fat content of 3.7 %, multiplied by factor 1.135	116	+119	+10.3
Butter	øre/kg	Weekly price	670	Intervention price	1516	+126	+10.8
Wheat	øre/kg	Producer price	54.2	Basic intervention price	87.9	+ 62	+ 6.2
Rye	øre/kg	Producer price	54.2	Basic intervention price	81.1	+ 50	+ 5.2
Barley	øre/kg	Producer price	46.9	Basic intervention price	81.1	+ 73	+ 7.1
Oats	øre/kg	Producer price	47.2	Market price	75.8	+ 61	+ 6.1
Maize	øre/kg	Purchase price	57.2	Intervention price	81.1	+ 42	+ 4.5
Sugar beet	øre/kg	Guaranteed producer price for contractual quantity	12.66	Minimum price	14.4	+ 14	+ 1.6
Rape	øre/kg	Weekly price (incl. subsidy)	99	Basic intervention price	169	+ 71	+ 6.9

[a] Hypothesis based on: 1 u.a.= Dkr 7.5783

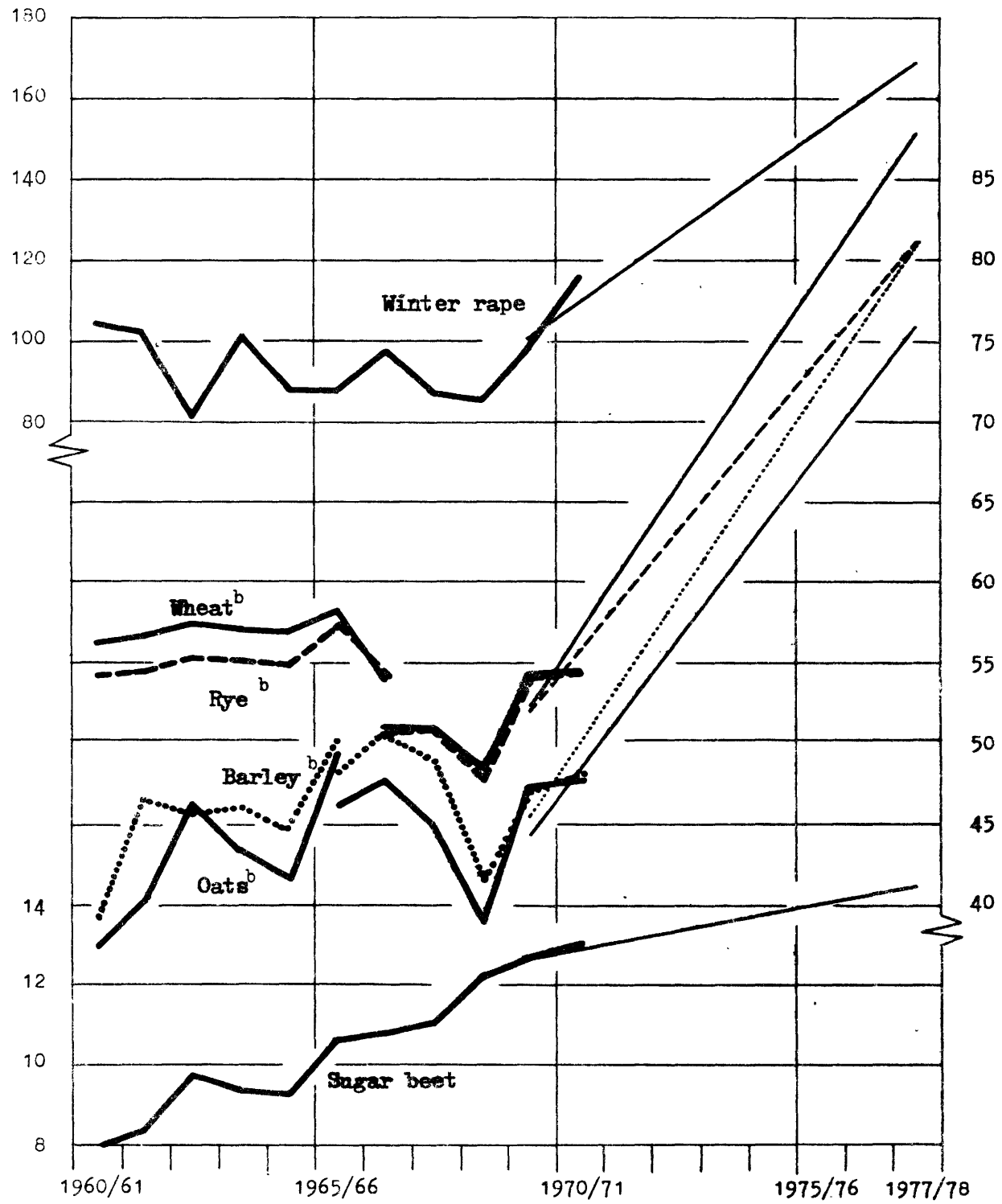
Source: Danmarks Statistik. Landbrugstatistik 1970, herunder gartneri og skovbrug. Copenhagen 1971. Own calculations and estimates.

In order to estimate correctly the average annual rates of price increases to be expected after Denmark's accession to the European Community, it would be necessary to compare these with the rates of price increases that would have been expected in the event of Denmark not acceding to the European Community. Such a comparison would have to be based on a detailed hypothesis of developments which would have taken place in Danish agriculture in the event of non-accession and, since many producer prices in Denmark are heavily dependent, also on analyses of the world market in a number of products. A comparison between the hypothetical average annual rates of price increases between 1969/70 and 1977/78 and the actual average rates of price increases between 1961/62 and 1969/70 would only be the first step in this type of analysis. Furthermore, since the prices of many products fluctuate in cycles, such a comparison could only be made on the basis of a trend in the rate of price changes and not on the basis of rates for price changes between the first and last years of a given period. Such detailed price analyses had to be dispensed with in this study (see, however, Figure 6).

4. Forecast of the domestic production and the export or import surpluses of important agricultural products in Denmark in 1977 (1977/78)

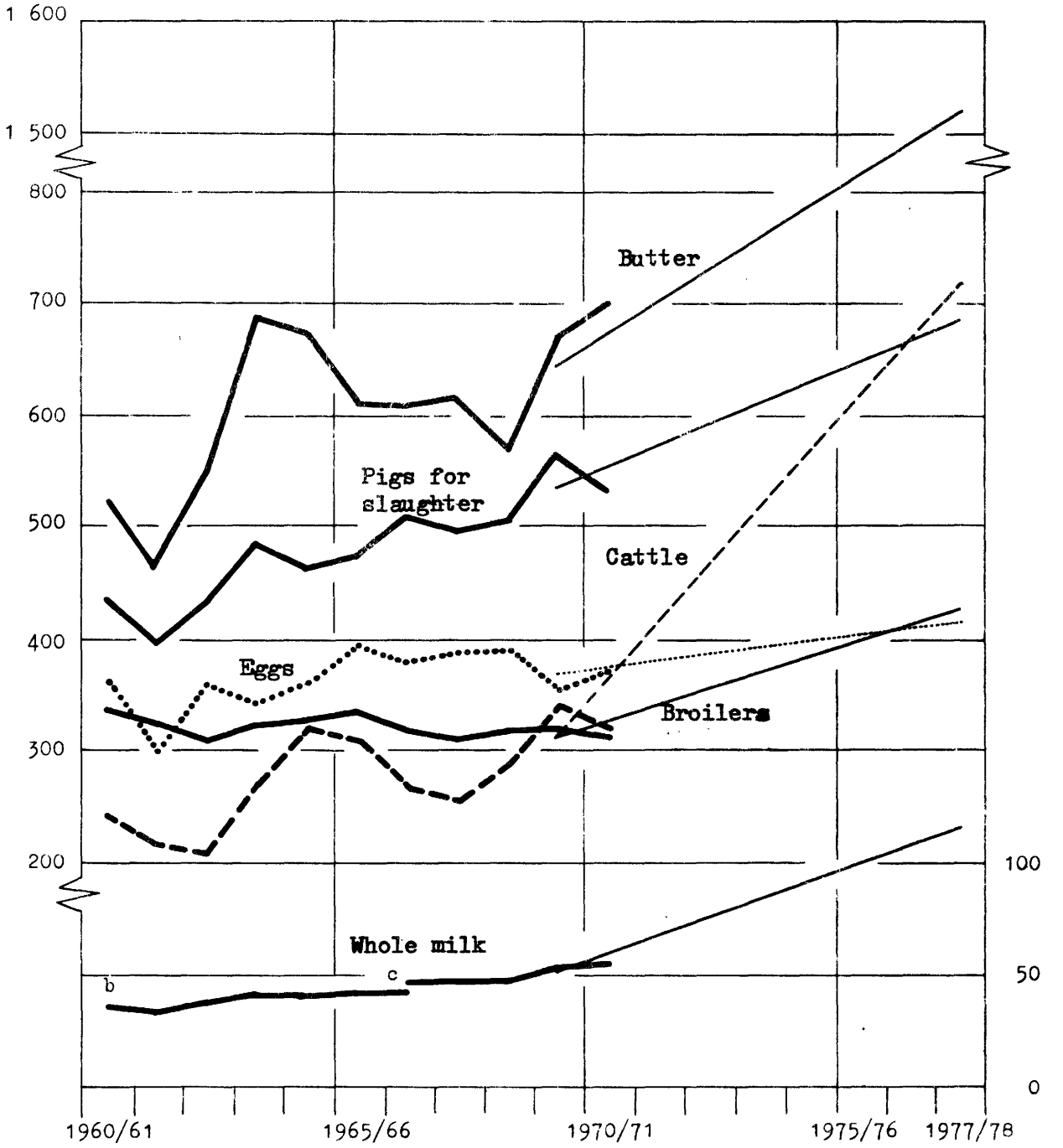
The above trends in the producer prices of individual products indicate that there will be some restructuring of Danish agriculture.

Figure 6 - Producer prices of selected agricultural products in Denmark 1960/61-1970/71, 1977/78[a] (öre/kg)



[a] Projection. [b] Stock exchange quotation.

Figure 6 (cont'd) - Producer prices of selected agricultural products in Denmark 1960/61-1970/71, 1977/78[a] (öre/kg)



[a] Projection. [b] 3,65% fat content. [c] 4,20% fat content.

a. Pigs

For 1977/78 we obtain a ratio of pig to barley prices of 8.5 : 1. In Denmark, in recent years, this ratio rarely dropped to such a low level and fell below it only briefly. The fattening of pigs may, therefore, have to operate in future on the basis of a rather unfavourable meat/feed cost ratio. Equation (51) for the stock of sows at the beginning of a given year produces a figure of only 990 000 animals for the beginning of 1977. The stock of sows would, therefore, remain more or less constant at the level it reached at the beginning of the years 1970-1972.

This stock of sows gives a market supply (exports of live animals + slaughterings in slaughterhouses) of 495 000 sows and boars in 1977, based on the average ratio between 1963 and 1970 of the market supply of sows and boars to the number of sows at the beginning of the year (50 %). In addition, a supply of 11 000 000 pigs for slaughter is to be expected in 1977 assuming that the ratio of the slaughterings of pigs for slaughter to the number of sows at the beginning of the year will not further deteriorate compared with 1970 (11 : 1). With estimated slaughter weights (including offals) of 145 kg for sows and boars and 62.5 kg for fat pigs, a meat supply (including offals) of 759 000 tons is obtained. If, as in recent years, 17 000 tons is added for pigs slaughtered on the farm, the total becomes 776 000 tons of meat including offals, broken down into 743 000 tons of meat and 33 000 tons of offals. With an estimated domestic consumption of 146 000 tons of meat, a total of 597 000 tons of meat remain for export in the form of live animals and meat, i.e. only 21 000 tons of meat more than in 1970 (+ 4%).

This additional quantity available in Denmark for export appears to be too small to compensate for the greatly expanding outlets to be expected on the UK market and for the considerable fall in Irish exports to this market, even if allowances are made for an expected offensive on the U.K. market by exporters in the Netherlands. It is probable that, in view of the expanding U.K. market, Danish pig farming will again expand as in the years up to 1965. It will, therefore, be assumed that the stock of sows in Denmark will increase to 1 150 000 head at the beginning of 1977 (+ 16% compared with the beginning of 1970)[1]. On the above assumptions, the result will be a market supply of 575 000 sows and boars and 12 650 000 pigs for slaughter. This is equivalent to a supply of 891 000 tons of meat including offals, of which 853 000 tons are accounted for by meat and 38 000 tons by offals. After deducting 146 000 tons of meat, i.e. the estimated domestic consumption, a total of 707 000 tons of meat remain for export in the form of live animals and meat, i.e. 131 000 tons (+ 23%) more than in 1970 (576 000 tons). Of this amount about 20 000 tons would probably be exported as live animals and the 687 000 tons as meat. The increase in meat supplies would result in an increase in the supply of pig offals, which would permit a more generous supply to the domestic market provided that offal exports remained steady. The same is true of lard.

b. Cattle

The more than two-fold increase in the prices of cattle, milk and butter will have a considerable effect on Danish cattle farming, since the latter will become a very profitable business despite the fact that until now, with full costing, it has shown a loss. For this reason, the decline in the dairy cow stock in Denmark has already been halted. In a projection of the dairy cow stock at the beginning of 1977 using equations (54) and (55) for dairy cow stock at the beginning of the year the values for 1972

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[1] This figure is obtained from equation (51) assuming that the trend after 1973 will continue to rise at the same rate as between 1958 and 1965.

Table 9 - Figures on pig farming in Denmark 1970, 1977[a]

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %
Stock of sows at beginning of year	1000 head	989	1150	+ 16	+ 2.2
Live exports of sows and boars	" "	138	140	-	-
Slaughterings of sows and boars	" "	347	435	+ 25	+ 3.3
Slaughterings of pigs for slaughter	" "	10896	12650	+ 16	+ 2.2
Pigmeat					
Gross domestic production	1000 t	738	853	+ 16	+ 2.1
Live exports	" "	21	20	-	-
Net production	" "	712	833	+ 17	+ 2.3
Net meat exports	" "	554	687	+ 24	+ 3.1
Food consumption	" "	145	146	+ 1	+ 0.1
Pig offals					
Production	" "	23	38	+ 15	+ 2.0
Exports	" "	9	9	-	-
Food consumption	" "	23	28	+ 22	+ 2.9
Lard					
Production	" "	40	46	+ 15	+ 2.0
Net exports	" "	9	11	+ 22	+ 2.9
Used in margarine industry	" "	7	7	-	-
Food consumption	" "	24	28	+ 17	+ 2.2

[a]Projection

Source : Tables 10*, 11*, 13*, 28*, 29*. Own calculations.

were, therefore, retained in the time variable t and the trend correction variable t_1. On the basis of the data in Table 8 the ratio of heifer to pig prices was taken as 1.1 allowance being made for the fact that in the past the heifer price in general was rather more than 5% above the average price for heifers and young cows. Both equations give a figure of 1 220 000 head for the dairy cow stock at the beginning of 1977. According to this projection, the dairy stock in Denmark would, therefore, expand by only 80 000 head (+ 7%) between 1972 and 1977.

However, this figure must greatly underestimate the actual expansion of the dairy cow stock to be expected due to the fact that the equations only take account of the short-term price effects in cattle farming that is, on the whole, not very profitable, whereas, in fact, cattle farming will become very profitable after Denmark's accession to the EEC despite increasing feed costs. The greatly increased profitability should result in an expansion in the dairy cow stock according to the existing capacity (i.e. on farms which already keep dairy cows) which in many cases is probably feasible from the point of view of labour and infrastructure. Furthermore, the increases profitability will probably bring about a reorganization of cattle farming as a result of new investment and the recruitment of additional labour on many farms. The expected increase in the number of animals is, however, likely to be accompanied by a reduction in the number of herds where farms are abandoned. On the whole, the dairy cow stock in Denmark should, nevertheless, increase substantially in the next few years. As the process of expansion takes a considerable amount of time, it is assumed here that at the beginning of 1977 there will be at least 1 500 000 dairy cows with the expansion process still under way[1]. This dairy cow stock is the central value for the supply of beef and that of milk and milk products.

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[1] See P.A. Andersen, P. Guldager, A. Schmelling et al. Projections of Supply and Demand for Agricultural Products in Denmark (1970-1980), op cit., p.199 et seq.

As the price of meat and the prices of milk and butter will increase to about the same extent, it is to be expected that even in the future Danish agriculture will not have any real beef cattle, although the market situation suggest that special emphasis should be put on meat production.

Given a price of 760 øre per kg for heifers in 1977/78, allowance being made for the fact that during the last few years heifer prices have been about 6% higher than the average price for heifers and young cows, equation (56) shows that live exports of calves and slaughterings of fat and suckling calves in a given year should be equivalent to 40% of the dairy cow stock at the beginning of the year. A ratio of this order of magnitude would appear quite plausible because it has also been noted in previous years, when the dairy cow stocks was not (yet) on the decrease and was, in fact, expanding because of favourable price relationships. Therefore, this ratio is used below for calculating beef and veal production in 1977.

On the basis of the conditions obtaining in the last few years there are expected to be no live exports of calves so that the slaughterings of fat and suckling calves in 1977 should amount to 40% of the dairy cow stock, which will number 1 500 000 head at the beginning of 1977. Again, going by conditions in the past few years, these 600 000 slaughterings of fat and suckling calves would break down into 550 000 fat calves (540 000 in slaughterhouses, 10 000 on farms) and 50 000 suckling calves (40 000 in slaughterhouses, 10 000 on farms). Since with a calving rate of nearly one, almost 1 500 000 calves will be born in 1977, this figure for

slaughterings means that a large proportion of bull calves will be fattened for more than one year, as was to be observed in the past during periods of favourable prices.

In order to calculate the market supply of adult animals it was assumed that at the beginning of 1976 the dairy cows stock would number 1 450 000 head and that, accordingly, about 1 450 000 calves would be born in 1976, of which 580 000 head would be slaughtered in 1976. Therefore, in 1977 870 000 animals will be available for live exports for slaughter and breeding, for the slaughter of adult animals and for replenishing and reorganizing the stocks of bulls, steers, dairy cows and heifers. Of this total 50 000 should be required for replenishing the dairy cow stock. It is further assumed that 70 000 head will be exported live for breeding purposes, used to replenish the stocks of bulls, steers and heifers, or will disappear for reasons not statistically recorded (disease, death). Therefore, in 1977 there will be 750 000 adult animals available for live export or slaughter. It is assumed that, in line with developments over the past few years, exports of live animals will further decrease to 50 000 adult animals so that 700 000 will be slaughtered in slaughterhouses.

As regards slaughter weights (excluding offals), it was expected that in those cases where the slaughter weight could be statistically calculated the trend observed in the past few years would continue whilst, where the statistics used estimates in the calculations, the estimates for 1970 can be retained (Table 31*).

Under these conditions, the production of beef and veal (minus offals) in Denmark would amount to 265 000 tons in 1977. After deduction of an estimated 86 000 tons of veal and beef for domestic consumption and of 14 000 tons of beef and veal equivalent to live exports, there would be

a balance of 165 000 tons of beef and veal available for export in the form of meat (+ 81% compared with 1970).

In line with the increased production of beef and veal the production of cattle offals and tallow will also expand so that, with net exports remaining constant, this will result in a much improved domestic supply situation (Table 10).

The average annual milk yield would tend to increase up to 1977 to about 4 200 kg of milk per cow so that it can be assumed that in Denmark in 1977 milk production will amount to 6 300 000 tons. In view of past developments, the milk fat content should be about 4.25%. If we deduct the estimate of human consumption on farms and of the amount of whole milk used as feed, arrived at on the basis of data from past years, we are left with 5 950 000 tons of milk supplied to diaries. Table 10 gives a breakdown of its utilization.

In forecasting the utilization of whole milk in dairies the following method was applied: the domestic consumption of standard milk together with that of chocolate milk, ice cream, sour milk, yoghourt, double cream, other cream, cream in ice cream and chocolate milk, skimmed milk, buttermilk, butter and cheese was estimated above (cf. Table 5). It was then assumed that in 1977, as during the last few years of the base period, there would be no imports of any of these products except cheese. Only in the case of cheese was it expected that in 1977 10% of the ottal domestic demand would be covered by cheeses not manufactured in Denmark. With regard to cheese exports, it was assumed that exports of Danish cheese to EEC countries, particularly to Germany, could be greatly expanded and that Denmark would suffer no severe setbacks on its other export markets.

Table 10 - Figures on cattle farming in Denmark 1970, 1977[a]

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %
Dairy cow stock at beginning of year	1000 head	1 237	1 500	+ 21	+ 2.8
Live exports of animals for slaughter:					
Animals over 1 year old	"	103	50	- 51	- 9.8
Calves	"	0	0	-	-
Slaughtering in slaughterhouses :					
Adult animals	"	482	750	+ 56	+ 6.5
Fat calves	"	576	540	- 6	- 0.9
Suckling calves	"	29	40	+ 36	+ 4.7
Farm slaughterings :					
Fat calves	"	10	10	-	-
Suckling calves	"	10	10	-	-
Exports of animals for breeding	"	13	15	-	-
Beef and Veal					
Gross domestic production	1000 t	221	265	+ 20	+ 2.6
Live exports	"	29	14	- 52	- 9.9
Net production	"	191	251	+ 31	+ 4.0
Meat exports	"	91	165	+ 81	+ 8.9
Human consumption	"	97	86	- 11	- 1.7
Cattle Offals					
Production	"	16	19	+ 19	+ 2.5
Export	"	4	4	-	-
Food consumption	"	11	14	+ 27	+ 3.5
Tallow					
Production	"	13	16	+ 23	+ 3.0
Net exports	"	2	3	+ 50	-
Used in margarine industry	"	3	3	-	-
Human consumption	"	8	10	+ 25	+ 3.2

Table 10 (cont'd) - **Figures on cattle farming in Denmark 1970, 1977**[a]

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %
Milk yield per cow	kg	4 016	2 200	+ 5	+ 0.6
Fat content of milk	%	4.23	4.25	-	-
Whole milk					
Production	1000 t	4 630	6 300	+ 36	+ 4.5
Human consumption on farms	"	150	150	-	-
Animal feed	"	200	200	-	-
Supplied to dairies	"	4 280	5 950	+ 39	+ 4.8
Dairy utilization					
Whole liquid milk	"	371	360	- 3	- 0.4
Whole milk in chocolate milk, ice cream, sour milk and yoghourt	"	37	58	+ 57	+ 6.6
Double cream	"	234	239	+ 11	+ 1.5
Other cream	"		20		
Cream in ice cream	"	48	66	+ 38	+ 4.7
Butter	"	2 584	3 964	+ 53	+ 6.3
Cheese	"	686	921	+ 34	+ 4.3
Condensed milk and milk powder	"	301	301	-	-
Exports of liquid, milk and cream	"	21	21	-	-
Domestic consumption of: Standard milk[b]	"	448	437	- 2	- 0.4
Chocolate milk, ice cream, sour milk and yoghourt[b]	"	47	71	+ 51	+ 6.1
Double cream[b]	"	22	26	+ 18	+ 2.1
Other cream[b]	"	10	6	- 40	- 6.1
Cream in ice cream and chocolate milk[b]	"	13	20	+ 54	+ 6.4

Table 10 (cont'd) - **Figures on cattle farming in Denmark 1970, 1977**[a]

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %
Skimmed milk					
Dairy output	1000 t	2 515[c]	3 745[c]	+ 49	+ 5.9
Utilization :					
Liquid milk	"	69	144	+109	+ 11.1
Added to whole milk	"	78	77	- 1	- 0.2
Cheese manufacture	"	372[d]	499[d]	+ 34	+ 4.3
Condensed milk and milk powder	"	319	319	-	-
Other dairy products	"	31	46	+ 48	+ 5.8
Human consumption on farms	"	20	20	-	-
Animal feed	"	1 628	2 640	+ 62	+ 7.1
Buttermilk					
Dairy output	"	221[e]	341[e]	+ 54	+ 6.4
Sold by dairies for general consumption	"	62	72	+ 16	+ 2.2
Human consumption on farms	"	30	30	-	-
Animal feed	"	128	269	+110	+ 11.2
Whey					
Supply = animal feed	"	941[f]	1 262[f]	+ 34	+ 4.3
Butter[b]					
Usable production	"	132	203	+ 54	+ 6.4
Exports	"	89	166	+ 87	+ 9.3
Food consumption	"	45	37	- 18	- 2.8
Cheese[b]					
Production	"	108	145	+ 34	+ 4.3
Exports	"	66	100	+ 52	+ 6.1
Imports	"	2	5	+150	+ 14.0
Food consumption	"	47	50	+ 6	+ 0.9

Table 10 (cont'd) - Figures on cattle in Denmark 1970, 1977[a]

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %

[a]Projection.

[b]Fat content: standard milk as well as whole milk in chocolate milk, ice cream, sour milk, yoghourt : 3.5%, double cream: 39%; other cream and cream in ice cream: 14%; butter: 83%; cheese: 27%.

[c]Whole milk for production of cream and butter, less butter production, less supply of buttermilk.

[d]54.2% of the whole milk for cheese production.

[e]8.6% of the whole milk for butter production.

[f]137% of the whole milk for cheese production.

Source : Tables 5,9*, 12*, 13*, 15* - 18*, 30*, 31*. Own calculations.

By using the fat content percentages given in Table 10, which reflect actual conditions over the past few years, the domestic consumption of standard milk, chocolate milk, ice cream, sour milk and yoghourt, double cream, other cream, cream in ice cream and chocolate milk, and also the production of cheese were converted into the amount of whole milk required to produce these quantities. It was assumed that there would be no change between 1970 and 1977 in the amount of whole milk used for the manufacture of condensed milk and milk powdered and for export as liquid milk and cream. After deduction of all the items listed from the total volume of milk supplied, a total of 3 960 000 tons of milk remains and it was assumed that it would be used entirely for butter production since intervention at intervention prices is compulsory for butter.

It follows that, in 1977, 203 000 tons of butter will be produced in Denmark, of which, after deducting 37 000 tons for domestic consumption, 166 000 tons will be available for export. This is 77 000 tons more than was actually exported in 1970 (+ 83%). In view of the fact that hitherto Danish butter was exported almost exclusively to the United Kingdom, that U.K. import requirements will, however, be significantly lower in 1977 than in 1970 and, above all, that in 1977 the U.K. quota for New Zealand butter will not be much lower than that for 1970, there will be serious marketing difficulties for Danish butter, particularly since Denmark will have to face stronger competition on the U.K. market from France, Ireland and the Netherlands once the import quotas are abolished. These marketing difficulties will probably be difficult to resolve since in 1977, as in previous years, there will be no important butter-importing market outside the United Kingdom.

As an indication of how much less butter would be produced if the dairy cow stock were smaller, the following figures should be noted : a fall of 100 000 head in the dairy cow stock in Denmark causes an annual decrease of 21 500 tons in Danish butter production. At the same time annual beef and veal production would fall by 19 500 tons (given 40 000 fewer steers and 60 000 fewer slaughterings of adult animals).

In line with the estimated increase in butter, cream and cheese production, a considerably larger volume of skimmed milk, buttermilk and whey will be produced in 1977 so that much larger amounts of these products will be available in 1977 for animal feed. It can, therefore, be assumed that Denmark will import no skimmed milk powder during 1977 and may even export some. But it was not possible to allow for this in the estimated consumption of skimmed milk since the amount of skimmed milk used for condensed milk and that used for milk powder are not given separately in Danish statistics.

c. Poultry

In the past export prices for broilers were so low that they were far from covering production costs. With the accession of Denmark to the EEC, markets, particularly in Germany, are opening up for the Danish poultry industry that hold out prospects of lucrative prices. Danish poultry keepers intend, therefore, to attack these markets agressively in order to win back a substantial share of the market, especially the German market. At the same time they do not wish to neglect the markets they have been supplying in recent years, most of which are outside Europe. Even if the necessary expansion of poultry farming, rather neglected in past years because of the unsatisfactory profit situation, will take some time, it should be largely completed by 1977. As there are no precedents for an expansion process under such conditions of competition as exist, it is

expected that Danish poultrymeat exports will increase to 84 000 tons (+ 60 % compared with 1970) so that in 1977, given an estimated domestic consumption of 41 000 tons, a total of 125 000 tons of poultrymeat would have to be made available, mainly in the form of broilers. This increase of just 60 % in the production of poultrymeat appears readily attainable.

Danish poultry farms have no particular incentive to increase production of eggs as the price situation is unlikely to change much. Consequently, a continuing slight decrease in egg production to 80 000 tons in 1977 (- 7% compared with 1970) is expected, especially as domestic consumption of eggs will probably decline slightly. This fall in egg production means that the number of laying hens will also decrease, as the increased in the demand for eggs for hatching to produce broilers will not be too marked.

d. Crop production

In view of the 16 % increase in the number of sows and the 21 % increase in the number of dairy cows by early 1977 (compared with the beginning of 1970), the total numbers of migs and cattle should increase by about the same percentages to about 10 050 000 (+ 15% compared with beginning of 1970) and 3 550 000 (+ 23% compared with beginning of 1970 respectively). This increase in the number of cattle will necessitate a considerable shift in the distribution of the total area used for agriculture towards grassland and green fodder at the expense of land under cereals.

Table 11 - **Figures on poultry farming in Denmark 1970, 1977[a]**

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %
Mid-year stocks :					
Poultry total	1000 head	17 847	22 300	+ 25	+ 3.2
Cockerels (½ year and older)	"	67	70	+ 4	+ 0.6
Hens (½ year and older)	"	6 330	5 930	- 6	- 0.9
Growing hens (under ½ year old)	"	3 641	3 550	- 3	- 0.4
Broilers (under ½ year old)	"	7 809	12 750	+ 63	+ 7.3
Turkeys	"	504	550	+ 9	+ 1.3
Ducks	"	638	650	+ 2	+ 0.3
Geese	"	180	150	- 17	- 2.6
Slaughterings in slaughterhouses :					
Broilers	"	57 389	102 000	+ 78	+ 8.6
Other table birds	"	1 979	1 880	- 5	- 0.7
Ducks	"	1 787	1 800	+ 1	+ 0.1
Geese	"	123	100	- 19	- 2.9
Turkeys	"	1 075	1 200	+ 12	+ 1.6
Slaughterings as % of mid-year stocks :					
Broilers	%	735	800	+ 9	+ 1.2
Other table birds	%	31.3	30.0	- 4	- 0.6
Poultrymeat					
Net production	1000 t	79	125	+ 58	+ 6.8
Exports	"	52	84	+ 62	+ 7.1
Human consumption	"	25	41	+ 64	+ 7.3

Table 11 (cont'd) - **Figures on poultry farming in Denmark 1970, 1977[a]**

	Unit	1970	1977[a]	Changes in 1977 compared with 1970 %	Average annual rate of change between 1970 and 1977 %
Eggs					
Annual laying yield per hen	kg	13.6	13.5	-	-
Production	1000 t	86	80	- 7	- 1.0
Net exports	"	22	23	+ 5	+ 0.7
Eggs for hatching	"	6	6	-	-
Human consumption	"	54	51	- 6	- 0.8
from: Market production	"	38	35	- 8	- 1.2
Farm consumption and direct farm sales	"	16	16	-	-

[a]Projection.

Source: Tables 5, 11*, 32*, 33*. **Own calculations.**

During the period of investigation Danish cattle farmers aimed to cover a large proportion of their protein and carbohydrate requirements by farm-produced fodder, particularly in the form of succulent feed. Hence the stocking rate, i.e. the number of cattle per hectare of grassland, remained constant after 1961, at between 3.6 and 3.8 head of cattle per hectare. As fodder yields per hectare of grassland tended to increase, so did the amount of green fodder consumed per head of cattle. At the same time the number of cattle per hectare of forage root crops steadily increased. Although forage yields per hectare of forage root crops tended to increase slightly for both roots and leaves, a smaller quantity of forage root crops tended to be fed to each head of cattle. However, this comparison between the total area under forage root crops or the total amount of forage root crops harvested and cattlenumbers is likely to prove problematie since fodder beet is also fed to pigs. However, this could not be taken into account here since no relevant statistical data are available. In addition, since 1963/64 annual oilcake consumption per dairy cow has remained steady at between 0.7 and 0.8 tons, after a previous sharp increase. Since then there has only been a tendency for oilcake consumption to increase temporarily when green fodder and forage root crop harvests have been worse than expected.

Below it is assumed that in view of the current, extremely high consumption of oilcake per dairy cow, the trends in cattle feeding described above will persist during the next few years. It is, therefore, anticipated that in 1977 the stocking rate will be about 3.8 head of cattle per hectare. Given an estimated cattle stock of 3 550 000 head, the area under grassland in 1977 would be 934 000 ha (+ 17% compared with 1970). It is also expected that the number of cattle per hectare of the aerea under forage root crops will increase to 18 by 1977 so that then the area under forage root crops total 197 000 ha (- 4% compared with 1970). At the same time it is likely

Table 12 - Figures on the area under grass and forage root crops in Denmark 1958 - 1970, 1977[a] (1957 - 1969/70, 1977/78[a])

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Number of cattle[b] per ha of grass	3.15	3.32	3.47	3.71	3.62	3.63	3.65	3.81	3.81	3.73	3.67	3.62	3.55	3.80
Number of cattle[b] per ha of forage root crops	7.9	8.1	8.1	9.1	9.6	10.1	10.2	10.8	11.5	12.3	12.6	13.4	13.9	18.0
	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Green fodder consumption per head of cattle[c] ('000 feed units[d])	1.23	1.28	1.10	1.14	1.15	1.13	1.21	1.32	1.32	1.35	1.39	1.29	1.20	.
Beef leaf consumption per head of cattle[c] ('000 feed units[d])	0.14	0.14	0.12	0.14	0.11	0.12	0.13	0.15	0.14	0.14	0.12	0.12	0.11	.
Beef root consumption per head of cattle[c] ('000 feed units[d])	0.79	0.79	0.59	0.82	0.70	0.63	0.66	0.70	0.55	0.62	0.54	0.55	0.46	.
Oilcake consumption per dairy cow (t)	0.44	0.50	0.65	0.65	0.57	0.60	0.74	0.76	0.78	0.78	0.73	0.69	0.83	.

[a]Projection [b]Mid-year stock [c]Stock at beginning of year. [d]A purely Danish concept : 1 feed unit = 1 kg barley.

Source: Danmarks Statistiks, Landbrugsstatistik, herunder gartneri og skovbrug, Copenhagen, various editions. Own calculations.

that, as before, it will be chiefly sugar beet for fodder purposes and half-sugar mangels with the highest yields per hectare that will be grown.

As for potato growing, it is assumed that, in line with the trend observed in recent years, potatoes will no longer be grown specially for fodder purposes. As potato exports in general are low - although they could pick up considerably when the quotas on the U.K. market are abolished - and as the industrial use of potatoes is likely to increase only slowly, while the human consumption of potatoes will decline substantially by 1977, production in 1977/78 is expected to total 720 000 tons slightly less than today's figure (- 15% compared with the average for 1968/69 - 1970/71). Given a small further increase in yields to 250 kg/ha, this will require only 29 000 ha to be planted with potatoes (- 22% compared with 1970).

It is also assumed that only as much sugar beet for sugar production as is needed to cover domestic consumption will be planted in 1977. With an estimated sugar yield from beet of 14.5% and a sugar beet output of 420 kg/ha, the expected sugar consumption of 241 000 tons in 1977 would require an area under cultivation of 40 000 hectares. The total area under root crops in 1977 would, therefore, be 266 000 ha, slighter smaller (- 8%) than in 1970.

It is further assumed that the area under pulses would increase only slightly compared with 1970 and would total about 30 000 ha in 1977, since it has already expanded very greatly in recent years. A considerable increase in the area under seed and other plants it to be expected as the rapidly rising price of rape should lead to increased cultivation of rape particularly as, for reasons of labour costs and mechanization, it is a

better crop rotation product than beet and as the same machinery can be used to sow and reap it as is used for cereals. Once its bitterness has been extracted, rape is suitable for the manufacture of margarine and vegetable oils. In addition, rape sales are guaranteed by compulsory intervention. Hence, it is expected that the area under rape and other seeds for industrial use will expand to 50 000 ha in 1977 (+ 138% compared with 1970). It is likely that to this would be added an area of about 60 000 ha under seed for field crops so that the total area under seed and other plants should increase to 110 000 ha in 1977 (+ 49% compared with 1970). The areas under horticultural produce and lying fallow are expected to be the same in 1977 as their average size over the past few years.

In this way all areas under cultivation were determined, with the exception of the area under cereals, which is equal by the difference between the sum of these areas and the total agricultural area. In the past the total agricultural area tended to decline by an average of about 15 000 ha each year. Since this trend will continue, the total agricultural area in Denmark in 1977 will be about 2 850 000 ha. Consequently, there will remain for the cultivation of cereals in 1977 an area of 1 498 000 ha, which is about 240 000 ha or 14% less than in 1970. As the price increase will be more or less the same for all cereals, the price ratios between the various cereals will not show any fundamental shifts. Consequently, when breaking down the considerably reduced area under cultivation into the different cereals the following was assumed: the cultivation of rye, which has the lowest yield per hectare and the smallest price increase, is limited to the area the yield from which covers estimated domestic consumption (90 000 tons). With an estimated yield of 3.4 tons per ha, an area of 30 000 ha will be needed.

Table 13 - **The agricultural area in Denmark 1970, 1977**[a]

	1970		1977		Change in 1977 compared with 1970	Average annual rate of change between 1970 and 1977
	'000 ha	%	'000 ha	%	%	%
Cereals	1 739	59.1	1 498	52.6	- 14	- 2.1
Wheat	114	3.9	100	3.5	- 12	- 1.9
Rye	44	1.5	30	1.1	- 32	- 5.3
Barley	1 352	46.0	1 198	42.0	- 11	- 1.7
Oats	184	6.3	170	6.0	- 8	- 1.1
Meslin	44	1.5	-	-	-	-
Pulses	27	0.9	30	1.1	+ 11	+ 1.5
Root crops	289	9.8	266	9.3	- 8	- 1.2
Potatoes	37	1.3	29	1.0	- 22	- 3.6
Sugar beet for sugar production	47	1.6	40	1.4	- 15	- 2.3
Fodder root crops	205	7.0	197	6.9	- 4	- 0.5
Grass and green forage crops	800	27.2	934	32.8	+ 17	+ 2.2
Seed and other plants	74	2.5	110	3.9	+ 49	+ 5.8
Fallow land	2	0.1	2	0.1	-	-
Horticultural products	11	0.4	10	0.4	-	-
Total agricultural area	2 941	100.0	2 850	100.0	- 3	- 0.5

[a]Projection

Source: Tables 34* and 35*. **Own estimates.**

The area under oats will fall only slightly to 170 000 ha, as oats are grown chiefly where the cultivation of other cereals is difficult because of the poor soil quality. As in the past, wheat will be grown only in the best soils in the southern part of the country on an area of about 100 000 ha, because the ratio of the wheat to barly prices is, if anything, deteriorating and from the point of view of demand there is no particular need for an expansion in the area under wheat. Meslin (mixed) will not be cultivated to any appreciable extent in 1977. This leaves 1 198 000 ha for the cultivation of barley (- 11% compared with 1970).

In view of the considerable reduction in the area under cereals, especially fodder grain, and given a 15% increase in the number of pigs, a 23% expansion in cattle farming and a 78% expansion in broiler production, Denmark will have to import considerable quantities of fodder grain, particularly barley and maize, in 1977/78 after having net grain imports averaging only 100 000 metric tons during the period 1968/69 - 1970/71. The new import figure might well exceed 1 000 000 tons.

As producer prices for apples, pears and tomatoes are considerably higher in Denmark than in the countries of the European Community, particularly Holland, production of these items is expected to fall in Denmark after its accession to the European Community so that with consumption increasing net imports of these products will probably expand significantly.

Table 14 - Figures on crop production in Denmark
1968/69 - 1970/71[a], 1977/78[b]

	Unit	1968/69 -1970/71[a]	1977/78[b]	Change in 1977/78 compared with 1968/69 - 1970/71 %	Average annual rate of change between 1968/69-1970/71 and 1977/78 %
Yield per hectare					
Wheat	100 kg/ha	45.7	48.0	+ 5	+ 0.7
Rye	"	32.1	34.0	+ 6	+ 0.8
Barley	"	38.6	40.0	+ 4	+ 0.5
Oats	"	36.5	39.0	+ 7	+ 1.0
Meslin (mixed grain)	"	33.5	-	-	-
Potatoes	"	238	250	+ 5	+ 0.7
Sugar beet for sugar production	"	395	420	+ 6	+ 0.9
Cereals					
Total usable production	1000 t	6 267	5 735	- 8	- 1.3
Wheat	"	445	456	+ 2	+ 0.4
Rye	"	123	97	- 21	- 3.3
Barley	"	4 786	4 552	- 5	- 0.7
Oats	"	716	630	- 12	- 1.8
Meslin (mixed grain)	"	197	-	-	-
Maize	"	-	-	-	-
Milo and Sorghum	"	-	-	-	-
Total used as seed	"	312	276	- 12	- 1.7
Wheat	"	20	18	- 10	- 1.5
Rye	"	7	6	- 14	- 2.2
Barley	"	246	223	- 9	- 1.4
Oats	"	39	29	- 26	- 4.0
Total industrial use	"	115	120	+ 4	+ 0.6

Table 14 (cont'd) - Figures on crop production in Denmark
1968/69 - 1970/71[a], 1977/78[b]

	Unit	1968/69 -1970/71[a]	1977/78[b]	Change in 1977/78 compared with 1968/69 - 1970/71 %	Average annual rate of change between 1968/69-1970/71 and 1977/78 %
Total human consumption	1000 t	419	390	- 6	- 1.0
Wheat	"	265	265	-	-
Rye	"	109	90	- 17	- 2.7
Barley	"	1	1	-	-
Oats	"	29	19	- 34	- 5.9
Meslin (mixed grain)	"	-	-	-	-
Maize	"	15	15	-	-
Milo and Sorghum	"	-	-	-	-
Total net imports	"	117	.	.	.
Wheat	"	-35[c]	.	.	.
Rye	"	17	.	.	.
Barley	"	-94[c]	.	.	.
Oats	"	6	.	.	.
Meslin (mixed grain)	"	-	.	.	.
Maize	"	216	.	.	.
Milo and Sorghum	"	7	.	.	.
Total used for animal feed	"	5 524	4 964[d]	.	.
Wheat	"	128	173[d]	.	.
Rye	"	22	0	.	.
Barley	"	4 315	4 209[d]	.	.
Oats	"	656	582[d]	.	.
Meslin (mixed grain)	"	197	-	.	.
Maize	"	200	.	.	.
Milo and Sorghum	"	5	.	.	.

Table 14 (cont'd) - Figures on crop production in Denmark 1968/69 - 1970/71[a], 1977/78[b]

	Unit	1968/69 -1970/71[a]	1977/78[b]	Change in 1977/78 compared with 1968/69-1970/71 %	Average annual rate of change between 1968/69-1970/71 and 1977/78 %
Sugar beet for sugar production					
Production	1000 t	1 977	1 680	- 15	- 2.3
Processing in sugar factories	"	1 939	1 662	- 14	- 2.2
Sugar yield	%	14.6	14.5	-	-
White Sugar					
Production	1000 t	287	241	- 16	- 2.5
Human consumption	"	234	241	+ 3	+ 0.4
Potatoes					
Usable production	"	802	650	- 19	- 3.0
Net exports	"	25	50	+100	+ 10.4
Seed	"	85	75	- 12	- 1.8
Fodder	"	146	65	- 55	- 10.9
Industrial use	"	170	160	- 6	- 0.9
Human consumption	"	376	300	- 20	- 3.1
Rape					
Area under rape	1000 ha	13	45	+246	+ 19.4
Yield	t/ha	1.98	2	+ 1	+ 0.1
Production	1000 t	25	90	+260	+ 20.1
Apples					
Area under apples	1000 ha	7.1	6.5	- 8	- 1.3
Yield	t/ha	12	12	-	-
Usable production	1000 t	77	70	- 9	- 1.4
Private production	"	38	38	-	-
Net imports	"	4	25	+525	+ 29.9
Domestic disposals	"	120	133	+ 11	+ 1.5

Table 14 (cont'd) - Figures on crop production in Denmark 1968/69 - 1970/71[a], 1977/78[b]

	Unit	1968/69 -1970/71[a]	1977/78[b]	Change in 1977/78 compared with 1968/69-1970/71 %	Average annual rate of change between 1968/69-1970/71 and 1977/78 %
Pears					
Area under pears	1000 ha	0.93	0.85	- 9	- 1.3
Yield	t/ha	9.7	9.7	-	-
Usable production	1000 t	8.4	7.7	- 8	- 1.2
Private production	"	4.1	4.1	-	-
Net imports	"	5.2	10.2	+ 96	+ 10.1
Domestic disposals	"	17.7	22	+ 24	+ 3.1
Tomatoes					
Area under tomatoes	1000 ha	0.12	0.10	- 17	- 2.6
Yield	t/ha	169	180	+ 7	+ 0.9
Usable production	1000 t	19.4	17.5	- 10	- 1.5
Private production	"	1.0	1.0	-	-
Net imports	"	20.4	28.5	+ 40	+ 4.9
Domestic disposals	"	40.8	47.0	+ 15	+ 2.0

[a]Average of three years. [b]Projection. [c]Net exports.
[d]Amount of Danish cereals available for animal feed.

Source: Tables 5, 1* - 8*, 19* - 23*, 38*. Own calculations

5. Revenue, expenditure and gross income in Danish agriculture in 1977

Table 15 is an attempt to project the revenue from the sale of Danish agricultural products in 1977. This revenue was generally calculated in such a way that the revenue in 1970 was extrapolated with the value index (1970 = 100), which is arrived at by multiplying the estimated quantity index (1970 = 100) by the assumed price index (1970 = 100). The development of this quantity index is based on the estimated volume of sales shown in Tables 9 - 11 and 14. Similarly, the development of the price index is generally based on the price hypotheses given in Table 9. For this purpose 1977 prices were taken to be the same as those for 1977/78. Nevertheless, there are differences between Table 15 and the rates of price changes shown in Table 8, since 1970 prices were used in the calculations for Table 15 instead of the 1969/70 prices, which were used for Table 8, and because when calculating the sale proceeds of Danish agriculture, account had to be taken of the fact that in 1970 higher prices were obtained from domestic sales than from exports, whereas it was assumed that in 1977 domestic and export prices were identical.

The following should be noted in connection with the calculations: for cereals sales in 1977 it was assumed that sales of wheat, rye and oats will equal domestic food consumption and that barley sales will be broken down into domestic human consumption, industrial utilisation and a quantity of 150 000 tons for export. The total proceeds in 1977 are arrived at by reference to the above volume of sales and the prices shown in Table 8. Therefore, in contrast to most other price indexes, the price index for cereals is a datum calculated as the quotient found on dividing the value index by the quantity index.

The quantity of potatoes sold was calculated by subtracting the 30 000 tons of garden produce from total net exports plus the quantity used industrially and that used for human consumption. The plant products not listed separately should yield sale proceeds of DKr 350 000 000 (compared with DKr 240 000 000 in 1970). This increase is entirely the result of the expansion in rape cultivation the estimated production value of which in 1977 is DKr 152 000 000 so that in 1977 the sale of industrial crop seeds should yield a total of DKr 160 000 000 (compared with DKr 37 000 000 in 1970). Based on the trend over the last few years sales proceeds of DKr 140 000 000 (1970: DKr 128 000 000) were assumed for seeds for field crops. Proceeds of DKr 50 000 000 (170: DKr 75 000 000) were forecast for all other products allowance being made for the fact that both prices and quantities would probably fall.

The price of milk used for whole milk and cream was taken throughout as being equal to the price of whole milk so that here, as in the case of cereals, the price index was obtained by taking the quotient found on dividing the value index by the quantity index. It was assumed that price changes for skimmed milk and butter milk would be the same as for milk used for whole milk and cream. With regard to the price of cheese, it was assumed that the average price for Danish cheese in 1977 would be equal to 75% of the threshold price for cheddar cheese (1 350 øre/kg). In the case of poultrymeat calculations were based on the assumption that prices for all kinds of poultrymeat would develop in line with broiler prices. On the basis of conditions in the last few years, horse flesh and lamb will yield Dkr 20 000 000 in 1977.

The projections show that in 1977 sale proceeds from Danish agricultural products should, at about Dkr 19 000 000 be slightly more than 80% higher than in 1970 (Dkr 10 400 000 000). If the volume changes for each of

Table 15 - **Total proceeds from the sale of Danish agricultural produce** 1970, 1977[a] ('000 000 Dkr)

	1970	1977[a]	1977[a] Value	1977[a] Volume 1970 = 100	1977[a] Price 1970 = 100
Total sale proceeds	10 407	18 933	182	(118)[b]	(154)[c]
Total crop products	1 046	1 219	117	.	.
of which: Cereals	454	540	119	72	165
Sugar beet	245	240	98	86	114
Potatoes	107	89	83	83	100
Total animal products	9 747	17 714	182	(122)[b]	(149)[c]
Dairy products	2 979	6 135	206	(132)[b]	(156)[c]
Whole milk and cream	812	1 340	165	105	157
Skimmed milk and buttermilk	119	217	182	116	157
Butter	1 090	3 052	280	154	182
Cheese	559	1 526	273	134	204
Equalization payment	402	.	.	.	.
Eggs	290	313	108	93	116
Meat-total	6 478	11 266	174	(119)[b]	(146)[c]
of which: Cattle	1 751	4 325	247	120	206
Pigs	4 428	6 332	143	116	123
Poultry	278	589	212	158	134
Changes in stocks and amounts	- 386	.	.	.	.

[a]Projection. [b]Only includes the products listed separately. Weighted by the 1970 value. [c]Taken the quotient found on dividing the value index by the quantity index.

Source : Tables 8 - 11, 14, 39*.

those products listed separately in Table 15 are weighted by their respective share of the total 1970 sale proceeds from those products, then for total production, total animal production and total dairy and meat production we can breakdown the total rise in proceeds into a quantity and a price component since, where these aggregates are concerned, the products not listed separately are of little significance. Since the items not listed separately are of considerable importance with regard to crop products, such a breakdown is not possible. This calculation gives the result that the estimated rise of over 80% in sale proceeds from Danish agricultural products between 1970 and 1977 is based on the fact that the quantities sold will increase on average by about 18% during this period, whilst prices will rise on average by more than 50%.

It was decided to dispense with a forecast of inputs since quantity and price structures for the past are known for only a few components and, therefore, generally speaking no projections of the changes in these data are possible. Only fodder input, in conjunction with a fodder trial, would offer the possibility of a reasonably well-founded forecast.

A N N E X E S

Table 1* - Balance sheet for wheat[a] in Denmark 1957/58 - 1969/70, 1977/78[b] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[b]
Area under wheat ('000 ha)	64	77	88	82	105	154	135	128	126	94	90	97	98	100
Yield per hectare (100 kg/ha)	42.4	35.6	41.3	39.0	41.2	41.8	36.7	42.3	44.6	42.7	46.6	48.0	43.7	48.0
Gross production	273	274	364	320	434	644	495	541	564	400	421	464	429	480
Usable production[c]	246	247	328	288	391	580	445	514	536	380	399	441	407	456
Changes in stocks	.	.	.	- 32	- 7	+ 57	- 16	+ 1	+ 46	- 90	0	- 6	- 2	.
Exports	2	2	2	8	32	67	47	94	42	47	10	50	38	.
Imports	130	152	81	31	24	13	37	11	13	31	16	12	10	.
Domestic consumption - total	374	397	407	343	342	469	451	430	461	454	405	409	381	.
Seed	14	16	15	19	28	24	23	23	17	16	17	18	21	18
Feed	101	117	133	73	90	180	160	143	186	179	131	131	100	.
Industrial use	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human consumption	259	264	259	251	272	265	268	264	258	259	257	260	260	265
per capita (kg)	57.5	58.3	56.7	54.6	58.7	56.8	57.0	55.7	54.0	53.8	53.0	53.3	53.0	51.4

[a] From 1962/63 adjusted for changes in stocks of wheat flour and in external trade in wheat flour and products containing wheat flour.

[b] Projection. Gross production minus wastage. Wastage was estimated at about 10 % of gross production up to 1963/64 and at 5% after 1964/65.

Source: Landbrugsstatistik 1900-1965. Bind I: Landbrugsareal og høstudbytte samt gødningsforbrug. (Statistike Undersøgelser Nr. 22). Danmarks Statistik, Copenhagen 1968. Landbrugsstatistik, herunder gartneriog skovbrug, various issues.

Table 2* - Balance sheet for rye[a] in Denmark 1957/58 - 1969/70, 1977/78[b] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[b]
Area under rye ('000 ha)	116	123	121	157	183	174	116	92	88	46	37	38	38	30
Yield per hectare (100 kg/ha)	27.1	25.0	23.9	29.0	28.1	29.5	27.6	31.5	30.2	29.4	31.5	34.0	32.9	34.0
Gross production	313	306	289	454	514	513	319	292	265	136	118	131	126	102
Usable production[c]	282	276	260	409	463	461	288	277	251	130	112	124	120	97
Changes in stocks	.	.	.	+ 30	- 25	+ 46	- 32	+ 14	- 16	- 19	- 4	+ 2	+ 1	.
Exports	1	0	0	1	83	59	29	1	2	2	2	2	2	.
Imports	37	21	41	5	11	3	22	3	27	39	38	19	16	.
Domestic consumption-total	318	297	301	383	416	359	313	265	292	186	152	139	133	97
Seed	22	22	28	33	31	21	17	16	8	7	7	7	8	6
Feed	153	134	141	218	255	212	174	131	169	66	31	20	15	.
Industrial use	6	5	5	5	4	4	3	3	2	2	3	2	2	1
Human consumption	137	136	127	127	126	122	119	115	113	111	111	110	108	90
per capita (kg)	30.4	30.0	27.8	27.6	27.2	26.1	25.3	24.3	23.7	23.0	22.9	22.6	22.0	17.5

[a]From 1962/63 adjusted for changes in stocks of rye flour and external trade in rye flour and products containing rye flour.
[b]Projection. [c]Gross production minus wastage. Wastage was estimated at about 10% of gross production up to 1963/64 and at 5% overall after 1964/65.

Source: As Table 1*.

Table 3* - Balance sheet for barley in Denmark 1957/58 - 1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Area under barley ('000 ha)	691	721	752	756	800	830	938	950	1041	1112	1170	1254	1305	1198
Yield per hectare (100 kg/ha)	37.0	34.5	31.1	37.1	35.1	39.8	36.2	41.0	39.6	37.4	37.5	40.2	40.3	40.0
Gross production	2560	2485	2338	2801	2808	3299	3399	3900	4125	4159	4382	5047	5255	4792
Usable production[b]	2304	2236	2104	2521	2527	2969	3059	3705	3919	3951	4163	4795	4992	4552
Opening stocks	.	.	.	83	124	98	220	141	218	277	171	161	337	.
Closing stocks	.	.	.	124	98	220	141	218	277	171	161	337	246	.
Exports	363	252	94	59	110	80	89	219	278	223	163	290	317	150
Imports	280	393	622	330	400	262	478	377	398	351	282	17	30	.
Domestic consumption - total	2221	2377	2632	2751	2843	3029	3527	3786	3980	4185	4292	4346	4796	.
Seed	130	135	136	144	149	169	171	187	200	219	233	240	247	223
Feed	1991	2147	2407	2506	2595	2755	3241	3490	3671	3863	3949	3994	4438	.
Industrial use[c]	96	91	86	98	96	102	112	106	101	101	107	110	110	119
Human consumption	4	4	3	3	3	3	3	3	2	2	3	2	1	1

[a] Projection. [b] Gross production minus wastage. Wastage was estimated at about 10% of gross production up to 1963/64 and at 5% after 1964/65. [c] For malting (in malthouses and breweries) and for alcohol production.

Source: As Table 1*.

Table 4* - Balance sheet for oats[a] in Denmark 1957/58 - 1969/70, 1977/78[b] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[b]
Area under oats	236	203	204	198	195	164	186	211	203	234	243	218	205	170
Yield per hectare (100 kg/ha)	33.4	31.9	27.8	34.3	35.0	37.1	36.1	39.0	38.3	37.0	37.2	39.6	37.4	39.0
Gross production	786	648	568	681	684	609	671	821	780	864	904	863	765	663
Usable production[c]	707	583	511	613	616	547	604	780	741	820	859	820	727	630
Opening stocks	.	.	.	22	36	25	47	22	43	62	45	52	69	.
Closing stocks	.	.	.	36	25	47	22	43	62	45	52	69	31	.
Exports	58	25	22	19	32	26	16	27	19	15	12	8	46	.
Imports	96	105	84	57	87	84	80	87	77	34	34	2	3	.
Domestic consumption - total	745	663	573	637	682	583	693	819	780	856	874	797	722	.
Seed	61	61	58	58	50	51	55	50	53	53	46	42	37	29
Feed	639	558	476	540	589	494	602	729	687	767	792	727	659	.
Industrial use	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human consumption	45	44	39	39	43	38	36	40	40	36	36	28	26	19
per capita (kg)	10.0	9.7	8.5	8.5	9.3	8.1	7.7	8.4	8.4	7.5	7.4	5.7	5.3	3.6

[a] From 1962/63 onwards exports of groats were taken into account. [b] Projection. [c] Gross production minus wastage. Wastage was estimated at about 10% of gross production up to 1963/64 and at 5% after 1964/65.

Source: As Table 1*.

Table 5* - Balance sheet for meslin (mixed grain) in Denmark 1957/58 - 1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1979/70	1977/78[a]
Area under meslin ('000/ha)	288	268	264	252	254	220	195	186	138	119	97	78	58	-
Yield oer hectare (100 kg/ha)	28.8	28.0	22.8	28.9	29.9	32.6	31.7	35.4	34.7	33.6	33.7	35.8	34.5	-
Gross production	829	752	602	727	759	719	619	659	479	401	328	280	200	-
Usable production[b]	746	677	542	655	683	648	557	626	455	381	312	266	190	-
Opening stocks	.	.	.	1	2	2	5	2	5	4	3	2	4	.
Closing stocks	.	.	.	2	2	5	2	5	4	3	2	4	3	.
Exports	-	-	-	0	0	0	0	0	0	0	0	0	-	-
Imports	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Domestic consumption - total	746	677	542	654	683	645	560	624	456	382	313	264	191	.
Seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feed	746	677	542	654	683	645	560	624	456	382	313	264	191	.
Industrial use	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human consumption	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[a]Projection. [b]Gross production minus wastage. Wastage was estimated at about 10% of gross production up to 1963/64 and at 5% after 1964/65.

Source: As Table 1*.

Table 6* - Balance sheet for maize in Denmark 1957/58 - 1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Usable production	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opening stocks	.	.	.	17	13	16	14	13	10	17	18	14	12	.
Closing stocks	.	.	.	13	16	14	13	10	17	18	14	12	23	.
Exports	-	-	-	0	0	1	-	-	-	-	0	0	-	-
Imports	38	97	187	156	218	151	123	161	192	223	210	151	261	.
Domestic consumption - total	38	97	187	160	215	152	124	164	185	222	214	153	250	.
Seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feed	38	97	187	160	205	144	116	144	165	202	199	138	236	.
Industrial use	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human consumption	.	.	.	-	10	8	8	20	20	20	15	15	14	15
per capita (kg)	.	.	.	-	2.2	1.7	1.7	4.2	4.2	4.2	3.1	3.1	2.9	2.9

[a]Projection.

Source: As Table 1*.

Table 7* - Balance sheet for milo and sorghum in Denmark 1957/58 —1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Usable production	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opening stocks	.	.	.	23	21	17	15	15	5	4	3	2	1	.
Closing stocks	.	.	.	21	17	15	15	5	4	3	2	1	1	.
Exports	-	-	-	0	0	0	-	-	-	-	0	0	-	-
Imports	184	427	476	231	318	173	146	121	56	42	27	13	4	.
Domestic consumption - total	184	427	476	233	322	175	146	131	57	43	28	14	4	.
Seed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Feed	183	425	475	232	320	172	141	126	50	36	22	9	4	.
Industrial use	1	2	1	1	2	3	5	5	7	7	6	6	0	.
Human consumption	-	-	-	-	-	-	-	-	-	-	0	0	-	-

[a]Projection.

Source : As Table 1*.

Table 8* - Balance sheet for all cereals in Denmark 1957/58 - 1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Usable pfoduction	4285	4019	3745	4486	4680	5205	4953	5902	5902	5662	5845	6446	6436	5735
Opening stocks	.	.	.	275	323	253	495	341	442	553	321	311	494	.
Closing stocks	.	.	.	323	253	495	341	442	553	321	311	494	377	.
Exports	424	282	117	87	257	219	162	328	326	274	172	336	388	.
Imports	765	1195	1491	810	1058	681	884	757	759	714	601	205	316	.
Domestic consumption - total	4626	4932	5119	5161	5551	5425	5829	6230	6224	6334	6284	6136	6481	.
Seed	251	258	260	277	278	283	283	288	289	295	303	307	313	276
Feed	3827	4128	4339	4360	4717	4584	4977	5375	5379	5495	5437	5283	5643	.
Industrial use	103	98	92	104	102	109	120	114	110	110	116	117	112	120
Human consumption	445	448	428	420	454	449	449	453	446	434	428	425	413	390

[a]Projection.

Source: As for Table 1*.

Table 9* - Balance sheet for beef and veal in Denmark 1958 - 1970, 1977[a] ('000 t slaughter weight[b])

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Gross domestic production	227.8	230.9	238.0	232.4	257.7	272.9	227.1	228.3	239.9	245.0	247.2	240.1	220.6	265
Exports of live animals	73.6	81.9	82.3	91.8	79.9	92.8	70.6	73.9	44.6	26.7	40.0	46.3	28.9	14
Net domestic production	154.2	149.0	155.7	140.6	177.8	180.1	156.5	154.4	195.3	218.3	207.2	193.8	191.7	251
Animals destroyed[c]	1.4	1.3	1.5	1.6	1.6	1.4	1.2	1.3	1.2	1.2	1.1	0.9	0.9	.
Net domestic production[d]	152.8	147.7	154.2	139.0	176.2	178.7	155.3	153.1	194.1	217.1	206.1	192.9	190.8	251
Imports of live animals	0.1	0	0	0	-	-	0.1	0	.	.	.	.	.	.
Net production	152.9	147.7	154.2	139.0	176.2	178.7	155.4	153.1	194.1	217.1	206.1	192.9	190.8	251
Changes in stocks	.	.	.	+ 4.9	+ 2.4	- 6.5	- 0.4	+ 0.9	+ 6.4	+ 3.3	- 2.5	- 7.7	+ 1.5	.
Exports of meat	83.8	72.2	80.8	59.2	86.7	105.7	78.9	75.1	97.8	122.2	115.3	95.6	91.2	165
Imports of meat	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Quantity available =														
Human consumption	69.2	75.6	73.5	75.0	87.2	79.6	76.9	77.2	89.2	90.7	92.5	103.9	97.4	86
per capita (kg)	15.3	16.6	16.0	16.3	18.8	17.0	16.3	16.2	18.6	18.7	19.0	21.3	19.8	16.7

[a]Projection. [b]Excluding offals and offal fat, including trimmed fat. [c]From 1966 calculated as a residual. [d]From slaughterings in slaughterhouses and at butchers, excluding animals destroyed and farm slaughterings.

Source: Landbrugsstatistik 1900-1965. Bind II Husdyrhold og animalsk produktion samt foderforbrug (Statistike Undersøgelser Nr. 25). Danmarks Statistik, Copenhagen 1969 - Landbrugsstatistik.. herunder gartmeri og skovbrug, various issues.

Table 10* - Balance sheet for pigmeat in Denmark 1958 - 1970, 1977[a] ('000 t slaughter weight[b])

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Gross domestic production	531.5	591.0	623.1	641.3	652.9	664.9	706.6	772.1	758.4	756.4	738.9	710.0	738.1	853
Exports of live animals	20.7	28.4	27.4	27.0	20.8	19.5	18.6	28.2	27.6	21.4	23.8	25.6	20.9	20
Net domestic production	510.8	562.6	595.7	614.3	632.1	645.4	688.0	743.9	730.8	735.0	715.1	684.4	717.2	833
Animals destroyed[c]	2.2	2.4	2.5	2.4	2.6	2.9	3.4	4.1	4.0	4.2	4.0	4.1	4.8	.
Net domestic production[d]	508.6	560.2	593.2	611.9	629.5	642.5	684.6	739.8	726.8	730.8	711.1	680.3	712.4	833
Imports of live animals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net production	508.6	560.2	593.2	611.9	629.5	642.5	684.6	739.8	726.8	730.8	711.1	680.3	712.4	833
Changes in stocks	- 5.8	+ 4.5	- 2.0	- 1.1	+ 4.4	- 5.4	+ 7.3	- 1.7	- 2.4	+13.1	- 1.4	- 1.1	+11.5	.
Exports of meat	351.5	388.1	432.3	448.8	475.7	500.9	528.4	590.1	573.3	564.5	565.7	535.1	554.8	688
Imports of meat	0	0	0	0	0	0.1	0.2	0.3	.	.	.	.	.	1
Quantity available =														
Human consumption	162.9	167.6	162.9	164.2	149.4	147.1	149.1	151.7	155.0	152.3	145.9	145.1	145.4	146
per capita (kg)	36.1	36.9	35.6	35.6	32.1	31.4	31.6	31.9	32.3	31.5	30.0	29.7	29.5	28.4

[a]Projection. [b]Excluding offals and offal fat, including trimmed fat. [c]Calculated as a residual from 1966. [d]From slaughterings in slaughterhouses and at butchers, excluding animals destroyed and farm slaughterings.

Source: As Table 9*.

Table 11* - Balance sheet for poultrymeat, mutton and lamb, and horseflesh in Denmark 1958 - 1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Poultrymeat[b]														
Net production	29.7	38.1	47.5	64.8	71.2	65.8	76.4	66.2	67.6	66.2	64.6	68.5	79.0	125
Changes in stocks	.	.	.	.	+ 3.8	- 3.3	+ 1.7	- 3.8	+ 2.4	- 2.2	+ 1.3	+ 1.2	+ 2.0	.
Exports	16.1	23.7	32.7	48.7	50.3	52.8	56.6	51.5	45.9	49.7	44.5	47.8	51.9	84
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quantity available =														
Human consumption	13.6	14.4	14.8	16.1	17.1	16.3	18.1	18.5	19.3	18.7	18.8	19.5	25.1	41
per capita (kg)	3.0	3.2	3.3	3.5	3.7	3.5	3.8	3.9	4.0	3.9	3.9	4.0	5.1	8.0
Mutton and lamb[c]														
Net production	1.0	1.1	1.2	1.2	1.1	1.1	1.2	1.4	1.9	2.7	3.0	2.5	2.0	.
Exports	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.4	0.3	0.1	.
Quantity available =														
Human consumption	1.1	1.2	1.3	1.3	1.4	1.3	1.4	1.6	2.1	3.0	3.0	2.4	2.5	2.5
per capita (kg)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.5	0.5	0.4
Horseflesh[c]														
Production	8.0	14.3	17.4	12.1	7.4	6.8	5.3	4.3	3.0	2.2	1.8	1.3	1.5	1
Exports	5.1	10.0	11.8	9.0	5.3	4.5	3.2	2.6	1.8	1.2	1.0	0.6	0.8	.
Quantity available =														
Human consumption	2.8	4.2	5.5	3.0	2.0	2.3	2.1	1.7	1.2	1.0	0.8	0.7	0.7	0.5
per capita (kg)	0.6	0.9	1.2	0.7	0.4	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1

[a]Projection. [b]84.75% of slaughter weight. [c]Slaughter weight including offals, offal fats and trimmed fat.

Source: As Table 9*

Table 12* - Balance sheet for offals[a] in Denmark 1958 - 1970, 1977[b] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[b]
Cattle offals[c]														
Production	14.9	15.4	15.8	18.6	19.4	20.7	16.6	16.7	17.6	18.0	18.2	17.6	16.3	19
Exports	9.8	10.3	10.7	10.5	11.1	11.5	8.6	8.5	.	.	.	.	.	.
Human consumption	5.0	5.0	5.0	8.0	8.2	9.1	8.0	8.1	10.7	10.6	9.9	10.2	10.6	14
Pig offals[d]														
Production	20.7	23.1	28.1	28.8	29.4	29.9	31.8	34.7	34.1	34.0	33.3	31.9	33.2	38
Exports	8.1	9.1	10.4	10.7	10.7	11.1	10.6	12.3	.	.	.	.	.	.
Human consumption	12.5	13.9	17.6	18.0	18.6	18.7	21.0	22.2	21.6	23.0	22.2	21.7	22.8	28
Offals - total														
Production	35.6	38.5	43.9	47.4	48.8	50.6	48.4	51.4	51.7	52.0	51.5	49.5	49.5	57
Exports	17.9	19.4	21.1	21.2	21.8	22.6	19.2	20.8	.	.	.	.	.	.
Human consumption	17.5	18.9	22.6	26.0	26.8	27.8	29.0	30.3	32.3	33.6	32.1	31.9	33.4	41
per capita (kg)	3.9	4.2	4.9	5.6	5.8	5.9	6.1	6.4	6.7	6.9	6.6	6.5	6.8	8.0

[a]Of cattle and pigs only. [b]Projection. [c]Calculated as percentage of slaughter weight minus offals : 7.1% for adult animals; 7.9% for fat calves; 7.5% for suckling calves. Calculated as percentage of slaughter weight minus offals : 3.9% up to 1959; 4.5% after 1960.

Source: As for Table 9*.

Table 13* - Balance sheet for lard and tallow in Denmark 1958-1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Tallow														
Production[b]	.	.	.	14.0	15.5	16.4	13.6	13.7	14.4	14.7	14.8	14.4	13,2	16
Exports	.	.	.	7.3	10,2	9.1	6.2	7.0	7.2	6.7	7.0	5.8	3.2	3
Use in margarine industry	.	.	.	7.3	6.4	8.6	3.4	2.9	3.4	3.0	3.0	3.0	3.0	3
Human consumption	.	.	.				5.7	5.2	5.0	5,6	5,3	6,5	8.2	10
per capita (kg)	.	.	.	.	.	.	1.2	1.1	1.0	1.2	1.1	1.3	1.7	2.0
Lard														
Production[c]	25.5	29.3	34.1	34.9	35.5	35.9	38.2	41.7	41.0	40.9	39.9	38.3	39.9	46
Exports	16,6	12.6	10.8	13.6	16.1	16.3	16.5	15.9	17.4	15.2	12.4	11.4	10.4	11
Changes in stocks	.	.	.	+0.6	-0.2	0	0	+1,1	-1.1	+0.2	-0.4	-0.5	+0.2	.
Use in margarine industry	4.1	7.8	11,0	8.2	7.3	5.6	4.3	6.1	6.7	7.0	7.0	7.0	7.0	7
Human consumption	5.6	8.6	12.2	12.5	12.2	14.0	17.4	18.4	17.8	18.7	21.3	21,6	23.6	28
per capita (kg)	1.2	1.9	2,7	2.7	2.6	3.0	3.7	3.9	3.7	3.9	4.4	4.4	4.8	5.5

[a]Projection. [b]6% of slaughter weight minus offals. [c]1958 : 4.6%; 1959: 4.7%; after 1960: 5.4% of slaughter weight minus offals.

Source: As for Table 9*.

Table 14* - Balance sheet for eggs in Denmark 1958-1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Mid-year stock of hens, 6 months old and over, ('000 head)	10 792	10 822	9 735	9 744	9 007	7 949	7 733	6 870	6 917	6 521	6 330	6 687	6 330	5930
Annual laying yield per hen kg)	14.5	14.8	14.2	13.0	12.6	13.4	12.9	13.1	13.0	13.6	13.6	13.4	13.6	13.5
Gross production	157.0	160.4	138.2	126.6	113.2	106.8	99.8	90.0	90.0	88.9	85.9	89.8	85.8	80
Changes in stocks	+ 0.5	+ 0.1	- 0.1	- 0.4	+ 0.8	+ 3.1	+ 2.5	+ 1.2	+ 1.5	+ 1.1	+ 1.6	+ 1.7	+ 3.4	.
Exports	108.1	109.6	87.0	70.9	53.8	40.4	32.3	25.8	28.2	26.7	24.6	28.8	23.7	23
Imports	-	-	-	-	-	1.1	0.2	2.0	4.8	3.0	3.3	2.1	1.7	.
Quantity available	48.4	50.7	51.3	56.1	58.6	64.4	65.2	65.0	65.1	64.1	63.0	61.4	60.4	57
Eggs for hatching	4.0	4.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6
Human consumption	44.4	46.7	47.3	50.1	52.6	58.4	59.2	59.0	59.1	58.1	57.0	55.4	54.4	51
from: Market production	24.4	26.7	27.3	30.1	32.6	40.4	43.2	43.0	43.1	42.1	41.0	39.4	38.4	36
Farm consumption and direct farm sales	20.0	20.0	20.0	20.0	20.0	18.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16
Human consumption: per capita (kg) of total	9.8	10.3	10.3	10.9	11.3	12.5	12.5	12.4	12.3	12.0	11.7	11.3	11.1	9.9
of market production	5.4	5.9	6.0	6.5	7.0	8.6	9.2	9.0	9.0	8.7	8.4	8.1	7.8	7.0

[a]Projection.

Source : As for Table 9*.

Table 15* - Balance sheet for whole milk in Denmark 1958-1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Mid-year stocks of dairy cows ('000 head)	1 415	1 433	1 436	1 493	1 463	1 408	1 370	1 350	1 350	1 329	1 292	1 233	1 153	1500
Average annual milk yield per cow (kg)	3 637	3 786	3 760	3 700	3 660	3 612	3 820	3 976	3 930	3 907	3 964	3 951	4 016	4200
Milk production from cows ('000 t)	5 147	5 426	5 399	5 524	5 355	5 086	5 233	5 367	5 306	5 193	5 122	4 872	4 630	6300
Average fat content of cow milk (%)	4.22	4.20	4.18	4.26	4.27	4.20	4.22	4.25	4.21	4.24	4.24	4.25	4.23	4.25
Average annual milk fat yield per cow (kg)	153.5	159.0	157.2	157.6	156.3	151.7	161.2	169.0	165.5	165.7	168.1	167.9	169.9	178.5
Total cow milk fat production ('000 t)	217.2	227.9	225.7	235.3	228.7	213.6	220.8	228.1	223.4	220.2	217.2	207.1	195.8	267.8
Cow milk production	5 147	5 426	5 399	5 524	5 355	5 086	5 233	5 367	5 306	5 193	5 122	4 872	4 630	6300
Human consumption on farms	200	200	200	200	200	200	200	200	200	195	155	150	150	150
Feed	200	200	200	250	200	200	200	200	200	200	200	200	200	200
Supplies to dairies	4 747	5 026	4 999	5 074	4 955	4 686	4 833	4 967	4 906	4 798	4 767	4 522	4 280	5950
Dairy use														
Liquid milk[b]	392	404	381	371	376	387	388	383	386	385	391	397	408	418
Cream[b]	236	244	248	232	237	242	247	243	246	252	259	276	281	325
Butter production	3 139	3 341	3 325	3 379	3 277	2 949	3 059	3 258	3 166	3 027	3 111	2 824	2 584	3964
Cheese production	684	731	716	757	729	777	794	731	801	800	656	672	686	921
Condensed milk and milk powder	266	278	298	306	306	302	316	324	274	308	327	330	301	301
Exports of liquid milk and cream	30	28	31	28	29	29	31	28	27	26	23	24	21	21
Human consumption[c] of -														
Standard milk	417	422	417	412	415	416	431	428	427	431	442	446	450	437
Whole milk in chocolate milk, ice cream, sour milk, and yoghourt	3	3	3	4	7	12	8	14	17	21	27	37	44	71
Double cream	16	17	17	18	19	19	20	21	21	22	22	22	22	26
Other cream	18	17	17	16	15	14	13	12	12	12	11	10	10	6
Cream in ice cream	5	6	6	6	5	6	6	6	8	9	11	12	12	20
Per capita consumption (kg) of -														
Standard milk	92.4	92.8	91.0	89.4	89.3	88.9	91.4	89.9	89.1	89.1	90.8	91.2	91.4	85.1
Whole milk in chocolate milk, ice cream, sour milk and yoghourt	0.7	0.7	0.7	0.8	1.4	2.6	1.7	2.9	3.5	4.3	5.6	7.5	8.9	13.9
Double cream	3.5	3.7	3.7	3.8	4.1	4.1	4.3	4.3	4.4	4.5	4.4	4.5	4.6	5.1
Other cream	4.0	3.7	3.7	3.5	3.3	2.9	2,8	2.6	2.5	2.4	2,2	2.1	2.0	1.1
Cream in ice cream	1.1	1.3	1.3	1.2	1.2	1.2	1.3	1.3	1.6	1.8	2.2	2.5	2.5	3.7

[a]Projection. [b]Including products thereof (chocolate milk, ice cream, sour milk and yoghourt). [c]Product weight.

Source: As for Table 9*. Danmarks Mejeri Statistik, Århus, various issues.

Table 16* - Balance sheet for butter and human consumption of margarine, lard and tallow in Denmark 1958-1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Usable production	158.9	168.0	166.7	171.3	166.8	149.3	155.7	166.3	159.8	153.7	159.5	144.3	131.5	203
Changes in stocks	-16.7	+0.1	-1.2	+2.3	+3.3	-1.8	+1.8	+2.7	+0.6	+3.3	+6.4	-2.0	-2.1	.
Exports	114.8	118.0	118.3	120.2	114.9	102.6	104.1	115.8	112.2	104.1	107.4	101.4[b]	88.8[b]	166
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human consumption	60.8	49.9	49.6	48.8	48.6	48.5	49.8	47.8	47.0	46.3	45.7	44.9	44.8	37
per capita (kg)	13.5	11.0	10.8	10.6	10.5	10.4	10.6	10.0	9.8	9.6	9.4	9.2	9.1	7.3
Human consumption of -														
Margarine - total	78.9	85.4	86.9	87.0	85.7	85.9	88.2	86.9	85.6	86.3	87.6	86.8	86.6	88
- per capita (kg)	17.5	18.8	19.0	18.9	18.4	18.3	18.7	18.3	17.9	17.8	18.1	17.8	17.6	17.1
Lard and tallow[c] - total	.	.	17.0	15.5	14.7	18.8	23.2	23.6	22.8	24.3	26.6	28.1	31.8	38
- per capita (kg) ...	.	.	3.7	3.4	3.2	4.0	4.9	5.0	4.7	5.0	5.5	5.7	6.5	7.5

[a]Projection. [b]Proportion of which in manufactured goods : 1969 : 1.2; 1970 : 1.6. [c]Excluding lard and tallow used for margarine production.

Source: As for Table 9*. Danmark Statistik. Statistik Årborg, various issues.

Table 17* - Balance sheet for cheese in Denmark 1958 - 1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Usable production	105.4	113.9	113.4	122.1	114.0	121.0	124.1	112.6	121.3	119.8	102.4	105.4	107.6	145
Changes in stocks	+0.7	+1.2	-1.5	+5.6	-6.7	+2.5	+0.2	-2.4	+2.6	+0.6	-6.2	+2.3	-2.8	.
Exports	71.1	77.4	74.6	77.2	80.1	77.6	80.9	73.5	76.1	77.6	64.8	60.0	66.2	100
Imports	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.8	0.5	0.6	1.8	2.2	2.4	5
Quantity available = human consumtion..	33.8	35.6	40.5	39.4	40.9	41.5	43.4	42.3	43.1	42.2	45.6	45.3	46.6	50
per capita (kg)	7.5	7.8	8.8	8.5	8.8	8.9	9.2	8.9	9.0	8.7	9.4	9.3	9.5	9.7

[a]Projection.

Source: As Table 9*.

Table 18* - Balance sheet for skimmed milk, buttermilk and whey in Denmark 1958 - 1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Skimmed milk														
Dairy output	3 034	3 217	3 228	3 241	3 157	2 874	2 974	3 155	3 038	2 911	2 993	2 736	2 515	3745
Disposals: Liquid milk[b]	18	19	18	18	19	25	30	34	38	47	58	67	75	144
Added to whole milk	28	22	39	46	46	42	50	56	56	63	73	77	77	77
Cheese manufacture	337	350	337	366	311	317	326	322	357	354	338	369	373	499
Condensed milk and milk powder	129	147	158	205	223	226	268	316	341	399	358	311	317	319
Other dairy products						10	10	10	10	10	9	10	17	46
Returned to farm	2 522	2 679	2 676	2 607	2 558	2 255	2 290	2 417	2 237	2 039	2 158	1 896	1 652	2660
Farmers' own consumption	25	25	25	25	25	25	25	25	25	23	20	20	20	20
Feed	2 497	2 654	2 651	2 582	2 533	2 230	2 265	2 392	2 212	2 016	2 138	1 876	1 632	2640
Buttermilk														
Dairy output	267	283	281	288	281	251	262	280	269	259	269	243	221	341
Consumption by producer	35	35	35	35	35	35	35	35	35	32	30	30	30	30
Feed	180	192	193	201	193	160	169	187	176	169	178	150	128	269
Dairy farm sales for human consumption	52	56	53	53	53	56	58	58	58	58	60	63	63	72
Whey														
Output = Feed	912	965	938	1 001	925	958	1 038	935	1 033	1 027	883	926	943	1262

[a]Projection. [b]Including ice cream and chocolate milk.

Table 19* - Balance sheet for sugar in Denmark 1958 - 1970, 1977[a] ('000 t)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Sugar beet for sugar production														
Area under sugar (ha)	91 247	55 247	54 809	38 662	41 874	69 226	83 847	60 372	57 588	52 551	52 164	52 077	47 326	40 000
Yield (t/ha)	35.5	28.8	40.7	36.1	34.4	37.5	37.6	31.2	37.5	40.7	41.2	37.6	40.0	42.0
Production	3 240	1 593	2 230	1 397	1 440	2 598	3 154	1 883	2 159	2 139	2 148	1 960	1 892	1 680
Adjustments	+ 48	0	+ 85	- 1	- 112	+ 72	+ 28	- 144	- 1	+ 77	+ 188	+ 48	+ 5	-
Actual production	3 288	1 593	2 315	1 396	1 328	2 670	3 182	1 739	2 158	2 216	2 336	2 008	1 897	1 680
Exports	786	96	106	63	67	436	509	98	138	88	87	80	4	.
Driers	11	9	15	2	5	17	15	10	10	7	6	6	5	.
Supplies to alcohol factories and breweries	21	6	-	-	-	-	-	-	-	-	-	-	-	-
Processing in sugar factories	2 470	1 482	2 194	1 331	1 256	2 217[b]	2 658	1 631	2 009	2 122	2 243	1 923	1 888	1 662
Sugar yield (%)	14.4	15.2	13.9	14.7	15.0	14.8	14.7	13.5	14.6	14.3	14.0	14.6	14.2	14.5
White sugar														
Usable production	356	226	305	195	188	336	392	221	294	303	313	280	268	241
Changes in stocks	.	.	.	.	.	+ 46	+ 31	- 61	+ 57	+ 42	- 66	+ 4	- 8	.
Exports	89	47	43	36	45	109	160	87	55	65	162	65	62	
Imports	2	2	7	17	42	54	28	31	46	35	17	25	24	-
Domestic use - total	.	.	.	.	.	235	230	226	228	232	235	236	237	241
Feed														
Losses	.	.	.	.	.	11	12	6	4	4	4	4	4	-
Industrial use														
Human consumption	223	209	222	219	218	224	218	221	224	228	231	232	233	241
per capita (kg)	49.4	46.0	48.5	47.5	46.9	47.8	46.2	46.4	46.8	47.0	47.4	47.5	47.4	47.0

[a]Projection. [b]Plus 59 000 metric tons of forage sugar beet.

Source: As for Table 1*.

Table 20* - Balance sheet for potatoes in Denmark 1957/58 - 1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Area under potatoes (ha)	87 632	82 688	87 063	92 190	72 330	62 131	64 050	54 382	40 618	40 437	37 405	35 015	33 503	28 000
Yield (t/ha)	20.3	18.8	19.9	21,3	20.6	18.7	20.8	22.3	23.1	24.0	22.9	24.7	19.8	25.0
Production	1 781	1 558	1 731	1 963	1 490	1 162	1 334	1 213	937	972	857	866	663	700
Wastage	178	155	173	195	149	116	130	121	94	98	86	87	66	70
Usable production														
Agricultural	1 603	1 403	1 558	1 768	1 341	1 046	1 204	1 092	843	874	771	779	597	630
Horticultural	60[b]	60[b]	55[b]	55	52	49	47	45	43	42	39	40	30	30
Exports	166	169	110	81	129	70	22	94	51	71	32	44	40	80
Imports	2	3	4	3	4	8	13	6	4	13	22	13	23	20
Domestic use - total	1 439	1 237	1 452	1 690	1 216	984	1 195	1 004	796	858	800	788	580	600
Seed	207	218	230	181	155	160	134	102	101	94	87	84	93	75
Feed	604	410	594	896	477	280	523	380	190	201	148	131	31	65
Industrial disposals	143	124	138	138	125	103	115	117	118	128	152	159	143	160
Potato flour	(120)	(110)	(124)	(119)	(109)	(90)	(98)	(96)	(99)	(108)	(128)	(134)	(118)	.
Alcohol	(23)	(14)	(14)	(19)	(17)	(13)	(17)	(21)	(19)	(20)	(24)	(25)	(25)	.
Human consumption	545	545	545	530	510	490	470	450	430	435	413	414	343	300
including potato flour	600[b]	600[b]	600[b]	585[b]	565[b]	545	520	505	480	490	460	460	385	340
per capita (kg)	133	132	131	127	122	117	111	107	100	102	95	94	78	66

[a]Projection. [b]Estimated or partly estimated.

Source: As for Table 1*.

Table 21* - Balance sheet for apples and pears in Denmark 1957/58 - 1970/71, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1977/78[a]
Apples															
Area under apples (ha)	.	.	.	.	.	.	7 529	7 587	6 910	7 114	7 277	7 132	7 002	7 089	6 500
Yield (tons/ha)	.	.	.	.	.	.	11.0	11.3	12.6	10.8	11.7	11.8	12.4	11.7	12
Production	.	.	.	.	.	.	83.0	86.0	86.9	76.8	85.1	84.2	87.2	83.2	78
Wastage	.	.	.	.	.	.	8.3	7.6	8.7	5.5	9.5	6.5	8.7	7.2	8
Usable production	95.8	98.7	92.3	88.4	70.7	65.9	74.7	78.4	78.2	71.3	75.6	77.7	78.5	76.0	70
Disclosed private production	.	.	.	.	.	.	36.8	38.6	38.5	35.1	37.2	38.3	38.6	37.4	38
Exports	.	.	.	.	.	.	13.6	10.8	9.9	10.5	9.6	15.7	11.3	10.5	10
Imports	.	.	.	.	.	.	8.6	10.2	10,9	18.5	16.3	14.5	17.4	18.6	35
Domestic use	84	116	85	110	85	97	106.5	116.3	117.7	114.4	119.6	114.7	123.1	121.5	133
per head (kg)	18.7	25.6	18.5	23.9	18.4	20.8	22.6	24.5	24.6	23.7	24.6	23.5	25.1	24.6	25.9
Pears															
Area under pears (ha)	.	.	.	.	.	.	918	948	984	864	920	926	923	949	850
Yield (tons/ha)	.	.	.	.	.	.	6.5	8.8	7.5	7.7	8.2	10.0	7.9	11.0	9.7
Production	.	.	.	.	.	.	6.0	8.3	7.4	6.7	7.6	9.3	7.3	10.5	8.2
Wastage	.	.	.	.	.	.	0.3	0.4	0.4	0.3	0.5	0.5	0.6	0.7	0.5
Usable production	.	.	.	.	.	.	5.7	7.9	7.0	6.4	7.1	8.8	6.7	9.8	7.7
Disclosed private production	.	.	.	.	.	.	2.8	3.9	3.5	3.1	3.5	4.3	3.3	4.8	4.1
Exports	.	.	.	.	.	.	0.1	0.1	0.1	0.1	0.1	0	0.1	0.2	0
Imports	.	.	.	.	.	.	2.0	3.8	3.4	6.4	4.7	4.9	5.5	5.5	10.2
Domestic use	.	.	.	.	.	.	10,4	15.6	13,9	15.8	15.3	17.9	15.4	19.8	22.0
per capita (kg)	.	.	.	.	.	.	2.2	3.3	2.9	3.3	3.2	3.7	3.1	4.0	4.2

[a]Projection.

Source: Danmarks Statistik, Landbrugsstatistik, herunder gartneri og skovbrug. Copenhagen, various issues.

Table 22* - Balance sheet for tomatoes in Denmark 1957/58 - 1970/71, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1977/78[a]
Area under tomatoes (ha)	.	.	.	.	.	.	125	133	141	135	127	117	118	117	100
Yield (tons/ha)	.	.	.	.	.	.	140.0	140.0	143.2	140.0	160.0	168.0	170.0	168.0	180
Production	.	.	.	.	.	.	17.5	18.6	20.2	19.6	20.3	19.7	20.1	19.6	18.0
Wastage	.	.	.	.	.	.	0.9	0.9	0.5	0.5	0.4	0.4	0.4	0.5	0,5
Usable production	.	.	.	.	.	.	16.6	17.7	19.7	19.1	19.9	19.3	19.7	19.1	17.5
Disclosed private production	.	.	.	.	.	.	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Exports	.	.	.	.	.	.	0.4	0.4	0.6	0.5	0.2	1.6	1.0	0.8	1.0
Imports	.	.	.	.	.	.	16.8	15.2	16.1	14.5	16.1	18.9	21.4	24.2	29.5
Domestic use	23	23	29	28	28	30	33.9	33.4	36.2	34.1	36.7	37.7	41.1	43.5	47
per capita (kg)	5.1	5.1	6.4	6.1	6.0	6.4	7.2	7.0	7.6	7.1	7.6	7.7	8.4	8.8	9.1

[a]Projection.

Source : As for Table 21*.

Table 23* - Balance sheet for rape in Denmark 1957/58 - 1969/70, 1977/78[a] ('000 t)

	1957/58	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1977/78[a]
Area under rape (ha)	1 040	4 293	5 430	8 380	11 429	24 932	15 649	25 320	27 170	20 716	19 782	14 698	11 895	45 000
Yield (tons/ha)	2.14	1.81	2.11	1.53	2.37	2.09	1.68	2.06	1.84	1.60	1.98	2.03	1.78	2.00
Production	2.2	7.8	11.4	12.8	27.0	52.1	26.4	52.3	49.9	33.1	39.2	29.9	22.5	90.0
Changes in stocks	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exports	.	.	.	.	27.9	44.8	26.4	46.8	40.0	30.5	19.5	9.5	6.9	.
Imports	.	.	.	.	0	0	0	1.0	0	0.5	2.7	0.1	0	.
Domestic use	.	.	.	.	.	.	.	.	.	.	.	.	.	.

[a]Projection.

Source: As for Table 21*.

Table 24* - Per capita consumption of selected foodstuffs in Denmark 1958 - 1970, 1977[a] (kg)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Milk and cream														
Whole milk	137.3	137.5	135.3	133.6	133.8	134.1	135.4	134.9	134.3	133.7	123.6	122.8	123.4	114
Skimmed milk and buttermilk	28.8	29.7	28.6	28.2	28.4	29.9	31.4	31.8	32.4	33.9	34.6	36.8	38.1	54
Sour milk and yoghourt	0.7	0.7	0.7	0.8	1.4	2.6	1.7	2.9	3.5	4.3	4.9	6.4	7.4	14
Cream	8.6	8.8	8.7	8.5	8.6	8.3	8.4	8.3	8.5	8.7	9.0	9.3	9.3	10
Fats														
Butter	13.5	11.0	10.8	10.6	10.5	10.4	10.6	10.1	9.8	9.6	9.4	9.2	9.1	7.3
Margarine	17.5	18.8	19.0	18.9	18.4	18.3	18.7	18.3	17.9	17.8	18.1	17.8	17.6	17.1
Lard and tallow[b]	1.2	1.9	2.7	2.7	2.6	3.0	3.7	3.9	4.7	5.0	5.5	5.7	6.5	7.5
Cheese	7.5	7.8	8.8	8.5	8.8	8.9	9.2	9.3	9.0	8.7	9.4	9.3	9.5	9.7
Eggs	9.8	10.3	10.3	10.9	11.3	12.5	12.5	12.4	12.3	12.0	11.7	11.3	11.1	9.9
Meat[c]														
Beef and veal	16.4	17.7	17.1	18.0	20.5	18.9	18.0	17.9	20.8	20.9	21.1	23.3	22.0	19.2
Pigmeat	41.5	43.1	42.6	41.8	38.6	38.1	38.9	39.2	38.0	37.3	34.6	34.1	34.2	33.8
Poultrymeat	4.3[c]	4.5[c]	3.8	4.1	4.3	4.1	3.8	3.9	4.0	3.9	3.9	4.0	5.1	8.0
Horseflesh	0.6	0.9	1.2	0.7	0.4	0.5	0.4	0.4	0.3	0.2	0.2	0.1	0.1	0.1
Mutton and lamb	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.6	0.6	0.5	0.5	0.4
Fish	12.2	10.3	17.4	14.3	15.9	16.8	17.7	21.3	21.1	22.5	21.4	19.6	18.2	24.0
Flour														
Wheat flour	42.7	44.5	42.5	43.0	42.8	43.3	42.5	42.1	41.5	41.2	40.1	40.2	40.8	39
Rye flour	30.6	29.8	28.8	28.1	27.4	26.8	25.7	25.1	24.7	23.8	23.3	22.8	22.7	17.5
Oat flour	5.2	5.0	4.3	4.5	4.1	3.9	3.9	3.8	3.5	3.4	3.5	3.1	2.9	2.1
Rice and rice flour	1.2	1.2	1.4	1.3	1.4	1.4	1.3	1.4	1.4	1.3	1.4	1.3	1.4	1.3
Potato flour	2.2	2.2	2.0	1.8	1.7	1.6	2.1	2.1	2.0	1.9	1.9	1.8	1.8	1.2
Other flours	.	.	.	.	.	.	0.7	0.6	0.7	0.6	1.7	2.0	2.5	3.0
Sugar	49.4	46.0	48.5	46.9	48.0	47.8	46.2	46.5	46.8	47.8	47.4	47.5	47.4	47.0
Potatoes[d]	118.5	117.7	115.7	110.6	105.2	99.9	100.0	95.0	90.0	90.4	85.1	84.9	69.9	60.0
Vegetables														
Cabbage	.	.	.	.	.	.	13.3	11.4	10.0	11.5	11.7	9.2	10.7	9
Vegetables other than those indicated	.	.	.	.	.	.	4.3	4.7	4.2	3.7	3.9	3.9	4.1	4
Root vegetables and tubers	.	.	.	.	.	.	14.2	11.6	11.1	13.9	11.1	12.9	12.2	11
Cucumbers, melons, pumpkins	.	.	.	.	.	.	4.3	3.4	3.6	4.6	4.4	4.9	4.6	5
Tomatoes	.	.	.	.	.	.	7.2	7.0	7.6	7.1	7.6	7.7	8.4	9
Peas, beans	.	.	.	.	.	.	3.1	2.9	3.2	3.1	2.9	2.7	2.6	3
Fruit and berries[d]														
Apples	.	.	34.3	24.9	25.6	27.8	22.6	24.5	24.6	23.7	24.6	23.5	25.1	26
Stone fruit	.	.	.	.	.	.	5.6	7.3	6.3	6.6	6.2	7.0	6.5	7
Strawberries	.	.	.	.	.	.	1.7	2.0	2.1	1.9	2.7	2.7	1.9	2
Grapefruit	.	.	.	.	.	.	1.5	2.1	2.1	2.1	1.9	2.2	2.3	2
Citrus fruit	7.3	8.1	8.7	9.3	10.5	9.2	11.3	11.4	12.0	11.0	10.3	10,9	11.0	12
Bananas	.	.	.	.	.	.	6.7	7.0	6.9	9.0	8.4	8,2	7.3	8
Dates, figs, raisins	.	.	.	.	.	.	1.5	1.4	1,6	1.4	1.5	1,3	1.3	1
Other fruit	.	.	.	.	.	.	3.2	3.5	3.5	3.9	3.5	3.8	4.4	4
Imported jam	.	.	.	.	.	.	0.7	0.7	1.0	1.5	1.5	1,3	1.5	2

[a]Projection. [b]Excluding quantity used in the margarine industry. [c]Including offals. [d]Farm years (e.g. 1969/70 = 1970)

Source: Danmarks Statistik, Statistik Årborg. Copenhagen, various issues.

Table 25* - Per capita calorie consumption from selected foodstuffs in Denmark 1958, 1964 - 1970 and 1977[a]

	1958	1964	1965	1966	1967	1968	1969	1970	1977[a]
Whole milk	94 737	93 426	93 081	92 667	92 253	85 284	84 732	85 146	78 660
Skimmed milk and buttermilk	10 080	10 990	11 130	11 340	11 550	12 110	12 880	13 335	18 900
Sour milk and yoghourt	483	1 173	2 001	2 415	2 967	3 381	4 416	5 106	9 660
Cream	18 920	18 480	18 260	18 700	19 140	19 800	20 460	20 460	22 000
Butter	119 340	93 704	89 284	86 632	84 864	83 096	81 328	80 444	64 532
Margarine	154 700	165 308	161 772	158 236	157 352	160 004	157 352	155 584	151 164
Lard and tallow	10 608	32 708	34 476	41 548	44 200	48 620	50 388	57 460	66 300
Cheese	18 750	23 000	23 250	22 500	21 750	23 500	23 250	23 750	24 250
Eggs	14 112	18 000	17 856	17 712	17 280	16 848	16 272	15 984	14 256
Beef and veal	37 884	41 580	41 349	48 048	48 279	48 741	53 823	50 820	44 352
Pigmeat	134 460	126 036	127 008	123 120	120 852	112 104	110 484	110 808	109 512
Poultrymeat	5 590	4 940	5 070	5 200	5 070	5 070	5 200	6 630	10 400
Horseflesh	546	364	364	273	182	182	91	91	91
Mutton and lamb	428	642	642	856	1 284	1 284	1 070	1 070	856
Fish	20 252	29 382	35 358	35 026	37 350	35 524	32 536	30 212	39 480
Wheat flour	155 428	154 700	153 244	151 060	149 968	145 964	146 328	148 512	141 960
Rye flour	97 614	81 983	80 069	78 793	75 922	74 327	72 732	72 413	55 825
Oat flour	20 020	15 015	14 630	13 475	13 090	13 475	11 935	11 165	8 085
Rice and rice flour	4 320	4 680	5 040	5 040	4 680	5 040	4 680	5 040	4 680
Potato flour	7 678	7 329	7 329	6 980	6 631	6 631	6 282	6 282	4 188
Other flours	2 520	2 520	2 160	2 520	2 160	6 220	7 200	9 000	10 800
Sugar	191 178	178 794	179 955	181 116	184 986	183 438	183 825	183 438	181 890
Potatoes	82 950	70 000	66 500	63 000	63 280	59 570	59 430	48 930	42 000
Cabbage	5 187	5 187	4 446	3 900	4 485	4 563	3 588	4 173	3 510
Vegetables other than those indicated	1 677	1 677	1 833	1 638	1 443	1 521	1 529	1 599	1 560
Vegetable roots and tubers	5 538	5 538	4 524	4 329	5 421	4 329	5 031	4 758	4 290
Cucumbers, melons, pumpkins	1 677	1 677	1 326	1 404	1 794	1 716	1 911	1 794	1 950
Tomatoes	2 808	2 808	2 730	2 964	2 769	2 964	3 003	3 276	3 510
Peas, beans	1 209	1 209	1 131	1 248	1 209	1 131	1 053	1 014	1 170
Apples	10 622	10 622	11 515	11 562	11 139	11 562	11 045	11 797	12 220
Stone fruit	2 632	2 632	3 431	2 961	3 102	2 914	3 290	3 055	3 290
Strawberries	799	799	940	987	893	1 269	1 269	893	940
Grapefruit	705	705	987	987	987	893	1 034	1 081	940
Citrus fruit	2 482	3 842	3 876	4 080	3 740	3 502	3 706	3 740	4 080
Bananas	3 149	3 149	3 290	3 243	4 230	3 948	3 854	3 431	3 760
Dates, figs, raisins	705	705	658	752	658	705	611	611	470
Other fruit	1 504	1 504	1 645	1 645	1 833	1 645	1 786	2 068	1 880
Jam	252	252	252	360	540	540	468	540	720
Total per capita calorie consumption	1 243 544	1 217 060	1 212 412	1 208 317	1 205 103	1 193 315	1 189 864	1 185 510	1 148 131
Daily per capita calorie consumption	3 407	3 334	3 322	3 310	3 302	3 269	3 260	3 248	3 146

[a] Projection.

Source: Table 24*, Own calculations.

Table 26* - Per capita protein consumption from selected foodstuffs in Denmark 1958, 1964 - 1970, 1977[a] (g)

	1958	1964	1965	1966	1967	1968	1969	1970	1977[a]
Whole milk	4 806	4 739	4 722	4 701	4 680	4 326	4 298	4 319	3 990
Skimmed milk and buttermilk	979	1 068	1 081	1 102	1 122	1 176	1 251	1 295	1 836
Sour milk and yoghourt	24	58	99	119	146	167	218	252	490
Cream	224	218	216	221	226	234	242	242	260
Butter	-	-	-	-	-	-	-	-	-
Margarine	-	-	-	-	-	-	-	-	-
Lard and tallow	-	-	-	-	-	-	-	-	-
Cheese	2 550	3 128	3 162	3 060	2 958	3 196	3 162	3 230	3 298
Eggs	1 078	1 375	1 364	1 353	1 320	1 287	1 243	1 221	1 089
Beef and veal	2 509	2 754	2 739	3 182	3 198	3 228	3 565	3 366	2 938
Pigmeat	4 233	3 968	3 998	3 876	3 805	3 529	3 478	3 488	3 448
Poultrymeat	516	456	468	480	468	468	480	612	960
Horseflesh	95	63	63	47	32	32	16	16	16
Mutton and lamb	29	43	43	57	86	86	72	72	57
Fish	2 367	3 434	4 132	4 093	4 365	4 152	3 802	3 531	4 656
Wheat flour	4 654	4 633	4 589	4 524	4 491	4 371	4 382	4 447	4 251
Rye flour	3 366	2 827	2 761	2 717	2 618	2 563	2 508	2 497	1 925
Oat flour	676	507	494	455	442	455	403	377	273
Rice and rice flour	80	87	94	94	87	94	87	94	87
Potato flour	187	179	179	170	162	162	153	153	102
Other flours	65	65	56	65	56	158	186	233	279
Sugar	-	-	-	-	-	-	-	-	-
Potatoes	2 015	1 700	1 615	1 530	1 537	1 447	1 443	1 188	1 020
Cabbage	160	160	137	120	138	140	110	128	108
Vegetables other than those indicated	52	52	56	50	44	47	47	49	48
Vegetable roots and tubers	170	170	139	133	167	133	155	146	132
Cucumbers, melons, pumpkins	52	52	41	43	55	53	59	55	60
Tomatoes	86	86	84	91	85	91	92	101	108
Peas, beans	37	37	35	38	37	35	32	31	36
Apples	136	136	147	148	142	148	141	151	156
Stone fruit	34	34	44	38	40	37	42	39	42
Strawberries	10	10	12	13	11	16	16	11	12
Grapefruit	9	9	13	13	13	11	13	14	12
Citrus fruit	37	57	57	60	55	52	55	55	60
Bananas	40	40	42	41	54	50	49	44	48
Dates, figs, raisins	9	9	8	10	8	9	8	8	6
Other fruit	19	19	21	21	23	21	23	26	24
Jam	4	4	4	5	8	8	7	8	10
Total per capita protein consumption	31 308	32 177	32 715	32 660	32 679	31 982	31 838	31 499	31 837
Daily per capita protein consumption	85.8	88.2	89.6	89.5	89.5	87.6	87.2	86.3	87.2

[a]Projection.

Source: Table 24*. Own calculations.

Table 27* - Per capita fat consumption from selected foodstuffs in Denmark 1958, 1964 - 1970, 1977[a] (g)

	1958	1964	1965	1966	1967	1968	1969	1970	1977[a]
Whole milk	5 629	5 551	5 531	5 506	5 482	5 068	5 035	5 059	4 674
Skimmed milk and buttermilk	173	188	191	194	198	208	221	229	324
Sour milk and yoghourt	29	70	119	144	176	201	262	303	574
Cream	1 892	1 848	1 826	1 870	1 914	1 980	2 046	2 046	2 200
Butter	13 500	10 600	10 100	9 800	9 600	9 400	9 200	9 100	7 300
Margarine	17 500	18 700	18 300	17 900	17 800	18 100	17 800	17 600	17 100
Lard and tallow	1 200	3 700	3 900	4 700	5 000	5 500	5 700	6 500	7 500
Cheese	1 575	1 932	1 953	1 890	1 827	1 974	1 953	1 995	2 037
Eggs	1 019	1 300	1 290	1 279	1 248	1 217	1 175	1 154	1 030
Beef and veal	2 132	2 340	2 327	2 704	2 717	2 743	3 029	2 860	2 496
Pigmeat	14 110	13 226	13 328	12 920	12 682	11 764	11 594	11 628	11 492
Poultrymeat	387	342	351	360	351	351	360	459	720
Horseflesh	14	9	9	7	5	5	2	2	2
Mutton and lamb	43	64	64	86	128	128	107	107	86
Fish	1 025	1 487	1 789	1 772	1 890	1 798	1 646	1 529	2 016
Wheat flour	470	468	463	457	453	441	442	449	429
Rye flour	581	488	478	469	452	443	433	431	333
Oat flour	390	293	285	263	255	263	233	218	150
Rice and rice flour	20	22	24	24	22	24	22	24	26
Potato flour	9	8	8	8	8	8	7	7	5
Other flours	28	28	24	28	24	68	80	100	120
Sugar	-	-	-	-	-	-	-	-	-
Potatoes	119	100	95	90	90	85	95	70	60
Cabbage	27	27	23	20	23	23	18	21	18
Vegetables other than those indicated	9	9	9	8	7	8	8	8	8
Vegetable roots and tubers	28	28	23	22	28	22	26	24	22
Cucumbers, melons, pumpkins	9	9	7	7	9	9	10	9	10
Tomatoes	14	14	14	15	14	15	15	17	18
Peas, beans	6	6	6	6	6	6	5	5	6
Apples	68	68	74	74	71	74	71	75	78
Stone fruit	17	17	22	19	20	19	21	20	21
Strawberries	5	5	6	6	6	8	8	6	6
Grapefruit	5	5	6	6	6	6	7	7	6
Citrus fruit	15	23	23	24	22	21	22	22	24
Bananas	20	20	21	21	27	25	25	22	24
Dates, figs, raisins	5	5	4	5	4	5	4	4	3
Other fruit	10	10	11	11	12	11	11	13	12
Jam	1	1	1	2	3	3	3	3	4
Total per capita fat consumption	62 084	63 011	62 705	62 717	62 580	62 024	61 696	62 126	60 934
Daily per capita fat consumption	170.1	172.6	171.8	171.8	171.5	169.9	169.0	170.2	166.9

[a] Projection.

Source: Table 24*. Own calculations.

Table 28* - Number of pigs in Denmark at the beginning of the year 1958-1971, 1977[a] ('000 head)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977[a]
Boars for service	13	14	16	16	18	19	19	23	24	25	25	26	28	32	20
Sows in pig for first time	79	123	100	111	113	102	140	129	115	159	113	136	213	150	.
Sows in pig for second time	254	254	282	309	338	274	127	158	148	143	139	126	137	160	.
Other sows in pig							258	291	298	294	302	299	301	321	.
Sows with piglets	150	157	184	187	199	219	224	264	244	248	256	255	287	306	342
Sows, not in pig or for slaughter	50	46	58	57	67	57	49	66	62	53	56	54	51	62	.
Total sows	533	580	624	664	717	752	798	908	867	897	866	870	989	999	1 150
Piglets	1 282	1 349	1 555	1 611	1 690	1 885	1 947	2 284	2 101	2 138	2 206	2 187	2 443	2 597	2 900
Store pigs (up to 35 kg)	1 389	1 453	1 618	1 615	1 856	1 809	1 843	1 973	1 986	1 933	1 892	1 777	1 854	1 869	2 220
Pigs (35-60 kg)	1 306	1 326	1 451	1 539	1 739	1 737	1 723	1 859	1 983	1 882	1 859	1 777	1 807	1 972	2 220
Fat pigs (over 60 kg)	771	840	941	993	1 052	1 058	1 114	1 158	1 198	1 206	1 213	1 132	1 229	1 264	1 540
Total pigs	5 294	5 562	6 205	6 438	7 072	7 260	7 444	8 205	8 159	8 081	8 061	7 769	8 350	8 733	10 050
Piglets per sow with litter	8.6	8.6	8.5	8.6	8.5	8.6	8.7	8.7	8.6	8.6	8.6	8.6	8.5	8.5	8.5
Store pigs (up to 35 kg) per sow with litter 3 months previously	8.7	9.2	8.4	8.5	7.9	7.9	8.3	7.4	7.0	7.3	6.9	6.9	6.6	6.1	6.5
Pigs (35-60 kg) per sow with litter 3 months previously	8.2	8.4	7.6	8.1	7.4	7.6	7.8	7.0	7.0	7.1	6.8	6.9	6.4	6.5	6.5
Fat pigs (over 60 kg) per sow with litter 6 months previously	4.9	5.7	5.4	5.3	4.9	4.9	5.2	4.5	4.3	4.8	4.5	4.3	4.6	4.6	4.5
Sows with litters as % of sow stock	28.1	27.1	29.5	28.2	27.6	29.1	28.1	29.1	28.1	27.6	29.6	29.3	29.0	30.6	29.7

[a]Projection.

Source: Danmarks Statistik, Landbrugsstatistik 1900-1965, Bind II, Husdyrhold og animalsk produktion samt foderforbrug. Copenhagen, 1969; Landbrugsstatistik 1966, 1967, 1968, 1969, 1970.

Table 29* - Imports, exports and slaughterings of pigs in Denmark, 1958-1970, 1977[a] ('000 head)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Imports of live animals	0	0	-	-	-	0	-	-	-	-	-	-	-	-
Exports of live animals	138	189	190	180	136	127	122	198	183	142	158	168	138	140
Sows and boars	138	189	178	179	136	127	122	181	183	141	156	168	138	140
Other	-	-	13	0	-	-	-	17	0	1	2	-	-	-
Slaughterings in slaughterhouses	7 748	8 468	9 197	9 555	10 008	10 305	10 907	11 990	11 503	11 546	11 367	10 744	11 277	13 085
Sows and boars	200	224	218	292	271	257	282	299	283	307	268	317	347	435
Fat pigs	7 478	8 189	8 912	9 222	9 697	10 011	10 653	11 650	11 189	11 208	11 069	10 400	10 896	12 650
Young pigs	70	55	67	41	40	37	36	41	31	31	30	27	34	.
Farm slaughterings	275	275	275	200	200	220	220	220	220	220	220	220	220	220
Exports and slaughterings of sows and boars as % of pig stock at beginning of year	61.9	69.5	61.9	69.3	55.4	49.8	49.4	51.5	52.3	48.6	47.6	54.1	47.7	50.0
Slaughterings of pigs for slaughter in proportion to sow stock at beginning of year	14.0	14.1	14.3	13.9	13.5	13.3	13.3	12.8	12.9	12.5	12.8	12.0	11.0	11.0
Average slaughter weight for slaughterhouse slaughterings (including offals, offal fats and trimmed fat) (kg)														
Sows and boars	.	.	.	.	.	145	144	144	146	146	146	150	145	145
Pigs for slaughter	.	.	.	.	.	61.7	61.9	61.3	62.8	62.9	62.4	62.5	62.5	62.5

[a]Projection.

Source: As for Table 28*.

Table 30* - Number of cattle in Denmark at beginning and middle of year 1958-1971, 1977[a] ('000 head)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977[a]
A. Number of cattle at beginning of year															
Bulls (1 year and over)	16	31	41	46	90	69	44	39	53	58	35	23	20	21	} 150
Steers (1 year and over)	44	41	46	50	55	82	67	53	55	53	51	40	29	23	
Dairy cows	1 488	1 456	1 482	1 465	1 499	1 458	1 385	1 369	1 369	1 355	1 344	1 303	1 237	1 172	1 500
Heifers (1 year and over)	619	623	633	653	680	647	631	633	648	655	648	622	594	571	670
Total calves (under 1 year)	984	1 073	1 111	1 144	1 137	1 137	1 070	1 089	1 141	1 110	1 064	1 016	1 017	979	1 230
Male calves	.	.	.	.	.	418	403	428	470	441	415	397	416	415	520
Female calves	.	.	.	.	.	719	667	661	671	669	649	619	601	564	710
Total cattle	3 151	3 224	3 313	3 358	3 461	3 393	3 197	3 183	3 266	3 231	3 142	3 004	2 897	2 766	3 550
B. Number of cattle in middle year															
Bulls (1 year and over)	24	43	37	78	85	43	35	48	62	42	26	19	18	20	.
Steers (1 year and over)	47	48	55	55	76	83	67	62	63	60	49	35	30	26	.
Dairy cows	1 415	1 433	1 438	1 493	1 463	1 408	1 370	1 350	1 350	1 329	1 292	1 233	1 153	1 105	.
Heifers (1 year and over)	724	737	740	768	772	726	723	746	742	750	719	695	651	622	.
Total calves (under 1 year)	1 063	1 118	1 127	1 199	1 108	1 083	1 082	1 139	1 157	1 101	1 055	1 018	990	950	.
Male calves	.	.	.	.	.	419	439	490	498	460	438	428	430	420	.
Female calves	.	.	.	.	.	664	643	649	659	641	617	590	560	530	.
Total cattle	3 273	3 379	3 396	3 593	3 504	3 343	3 277	3 345	3 374	3 282	3 141	3 000	2 842	2 723	.
Number of calves at beginning of year as % of dairy cow stock in middle of previous year - total	67.9	75.8	77.5	79.7	76.2	77.7	76.0	79.5	84.5	82.2	80.1	78.6	82.5	84.9	85
Male calves	.	.	.	.	.	28.6	28.6	31.2	34.8	32.7	31.2	30.7	33.7	36.0	36
Female calves	.	.	.	.	.	49.1	47.4	48.2	49.7	49.6	48.8	47.9	48.7	48.9	49
Number of heifers at beginning of year as % of dairy cow stock at beginning of previous year	41.3	41.9	43.5	44.1	46.4	43.2	43.3	45.7	47.3	47.8	47.8	46.3	45.6	46.2	48
Number of steers at beginning of year as % of dairy cow stock at beginning of previous year	2.9	2.8	3.2	3.4	3.8	5.5	4.6	3.8	4.0	3.9	3.8	3.0	2.2	1.9	.
Number of bulls at beginning of year as % of dairy cow stock at beginning of previous year	1.1	2.1	2.8	3.1	6.1	4.6	3.0	2.8	3.9	4.2	2.6	1.7	1.5	1.7	.
Milk production	5 147	5 426	5 399	5 524	5 355	5 086	5 233	5 367	5 306	5 193	5 122	4 872	4 630	4 557	6 300
Milk per cow (kg)	3 637	3 786	3 760	3 700	3 660	3 612	3 820	3 976	3 930	3 907	3 964	3 951	4 016	4 124	4 200

[a]Projection.

Source: As for Table 28*.

Table 31* - Exports and slaughterings of cattle in Denmark 1958-1970, 1977[a] ('000 head)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Exports of live animals for slaughter														
Animals over 1 year	303	335	336	301	286	334	250	263	159	95	143	165	103	50
Calves	1	5	5	63	3	1	4	3	0	0	0	0	0	0
Slaughterings in slaughterhouses														
Adult animals	381	368	386	404	552	544	410	388	519	597	543	484	482	750
Fat calves	526	508	533	404	469	534	520	474	553	584	627	599	576	540
Suckling calves	113	105	94	117	140	120	56	37	45	54	53	38	29	40
Farm slaughterings														
Fat calves	36	36	36	12	12	12	12	12	12	12	12	12	10	10
Suckling calves	72	72	72	24	24	24	24	24	24	24	24	24	10	10
Exports of live animals for breeding	17	9	12	6	5	5	12	12	9	10	12	17	13	15
Imports of live animals	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Slaughter weight excluding offals (kg)														
Exports of live animals for slaughter														
Animals over 1 year	.	.	.	.	.	.	280	280	280	280	280	280	280	280
Fat calves	.	.	.	.	.	.	130	130	130	130	130	130	130	130
Slaughterings in slaughterhouses														
Adult animals	.	.	.	.	.	.	224	233	235	239	233	235	234	235
Fat calves	.	.	.	.	.	.	120	131	128	126	125	131	135	135
Suckling calves	.	.	.	.	.	.	13.7	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Farm slaughterings														
Fat calves[b]	.	.	.	.	.	.	125	125	125	125	125	125	100	100
Suckling calves[b]	.	.	.	.	.	.	20	20	20	20	20	20	20	20
	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	
Exports of live animals for slaughter														
Animals over 1 year	.	.	320	316	301	292	226	250	120	128	145	138	72	.
Calves	.	.	37	32	2	1	6	0	0	0	1	0	0	.
Slaughterings in slaughterhouses														
Adult animals	.	.	361	481	583	460	397	427	593	566	506	485	494	.
Fat calves	.	.	430	464	501	520	489	512	578	604	612	600	572	.
Suckling calves	.	.	88	149	141	68	43	40	51	55	44	34	23	.
Farm slaughterings														
Fat calves	.	.	24	12	12	12	12	12	12	12	12	11	10	.
Suckling calves	.	.	48	24	24	24	24	24	24	24	24	17	10	.
Exports of live animals for breeding	.	.	12	6	5	7	14	9	9	12	15	16	11	.
Imports of live animals	.	.	0	0	0	0	0	0	0	0	0	0	0	.

[a]Projection. [b]Including offals.

Source: As for Table 28*.

Table 32* - Number of horses, sheep and poultry in Denmark in the middle of the year, 1958-1970, 1977[a] ('000 head)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Horses	237	212	171	125	100	81	64	53	45	42	40	42	45	40
Sheep	36	42	44	47	52	61	71	93	112	122	110	90	70	40
Total fowl	26 272	26 506	24 484	30 575	29 047	25 281	24 982	20 264	20 527	18 594	18 448	18 421	17 847	22 300
Cockerels (6 months and over)	89	92	75	91	83	79	84	81	72	76	73	75	67	70
Hens (6 months and over)	10 792	10 822	9 735	9 744	9 007	7 949	7 733	6 870	6 917	6 521	6 330	6 687	6 330	5 930
Growing hens (under 6 months)	15 391	15 592	8 708	9 868	7 450	7 127	5 427	4 671	4 534	4 155	4 335	4 532	3 641	3 550
Broilers (under 6 months)			5 966	10 872	12 507	10 126	11 738	8 642	9 004	7 842	7 710	7 127	7 809	12 750
Number of growing hens as % of number of hens.	.	.	89.5	101.3	82.7	89.7	70.2	68.0	65.5	63.7	68.5	67.8	57.5	60
Egg production ('000 tons)	157.0	160.4	138.2	126.6	113.2	106.8	99.8	90.0	90.0	88.9	85.9	89.8	85.8	80
per hen (kg)	14.5	14.8	14.2	13.0	12.6	13.4	12.9	13.1	13.0	13.6	13.6	13.4	13.6	13,5
Turkeys	62	74	75	155	149	153	282	262	439	465	349	420	504	550
Ducks	578	779	510	1 253	812	504	644	712	819	639	559	620	638	650
Geese	225	275	271	252	257	175	208	276	242	202	174	182	180	150

[a]Projection.

Source : As for Table 28*.

Table 33* - Poultry exports and slaughterings in Denmark 1958 - 1970, 1977[a] ('000 head)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Exports of live poultry :														
Chicks	568	208	417	590	48	129	607	3 770	128	330	114	163	71	.
Other poultry	1	65	357	551	117	241	558	745	468	222	158	269	367	.
Slaughterings in slaughterhouses :														
Broilers	.	.	.	48 931	56 745	55 558	63 361	52 816	51 908	50 604	47 024	51 133	57 389	102 000
Hens	.	.	.	6 035	5 891	3 683	3 725	2 397	2 519	1 936	1 409	1 784	1 979	1 880
Ducks								2 148	1 860	1 637	1 746	1 747	1 787	1 800
Geese	.	.	.	2 875	1 932	1 444	2 206	193	153	123	117	125	123	100
Turkeys								418	689	879	840	804	1 075	1 200
Slaughterings as % of stock in middle of year														
Broilers	.	.	.	450	454	549	540	611	576	645	610	717	735	800
Hens	.	.	.	61.9	65.4	46.3	48.2	34.9	36.4	29.7	22.3	26.7	31.3	30.0
Average weight (kg)[b]														
Broilers	.	.	.	.	.	.	.	0.95	0.98	0.99	1.04	1.02	1.07	1.05
Hens	.	.	.	.	.	.	.	1.8	1.8	1.8	1.9	1.8	1.8	1.8
Ducks	.	.	.	.	.	.	.	1.7	1.8	1.8	1.9	1.9	1.8	1.8
Geese	.	.	.	.	.	.	.	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Turkeys	.	.	.	.	.	.	.	4.8	4.8	4.9	5.0	4.9	4.8	4.8

[a] Projection. [b] 84.75 % of slaughter weight (live weight less blood and feathers).

Source: As for Table 28*.

Table 34* - Agricultural area in Denmark 1958-1970, 1977[a] (ha)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Wheat	76 950	88 263	82 059	105 341	153 953	134 630	128 133	126 482	93 674	90 342	96 568	98 236	114 245	100 000
Rye	122 595	120 767	156 752	182 674	173 791	115 901	92 628	87 599	46 229	37 471	38 487	38 326	44 315	30 000
Barley	720 568	751 684	755 824	799 439	829 612	938 255	949 992	1041 475	1111 604	1169 881	1253 888	1304 809	1351 545	1198 000
Oats	203 099	203 842	198 301	195 284	164 042	185 797	210 657	203 480	233 668	242 806	218 220	204 685	184 370	170 000
Meslin	268 265	264 339	251 584	253 817	220 600	195 134	186 195	137 931	119 489	97 227	78 033	58 113	44 469	-
A. Total grain	1391 477	1428 895	1444 520	1536 555	1541 998	1569 717	1567 605	1596 967	1604 664	1637 727	1685 196	1704 169	1738 944	1498 000
B. Pulses	7 356	6 077	8 362	10 140	8 980	7 540	6 016	3 539	2 982	6 427	12 487	25 563	26 590	30 000
Potatoes	82 688	87 063	92 190	72 330	62 131	64 050	54 382	40 618	40 437	37 405	35 015	33 503	37 058	29 000
Sugar beet for sugar production	91 247	55 247	54 809	38 662	41 874	69 226	83 847	60 372	57 588	52 551	52 164	52 077	47 326	40 000
Sugar beet as feed	55 855	53 272	54 624	53 147	53 907	38 781	35 304	31 902	28 940	29 855	32 267	37 143	45 809	
Half sugar mangel	142 262	150 685	153 673	153 039	137 794	130 823	132 167	134 656	126 648	123 154	117 755	114 581	112 143	197 000
Fodder beet, turnips	20 125	17 361	17 969	14 359	10 596	6 211	4 653	4 276	3 555	2 741	3 949	3 235	2 829	
Swedes	195 625	195 988	194 008	173 807	163 009	155 307	147 542	138 257	134 441	110 950	95 844	69 505	44 032	
C. Total root crops	587 802	559 616	567 273	505 344	469 311	464 398	457 895	410 081	391 609	356 656	336 994	310 044	289 197	266 000
Lucerne	18 402	15 059	16 204	18 880	20 150	16 740	17 156	15 969	15 215	15 634	18 353	20 295	20 226	.
Green forage	3 529	3 684	6 584	8 147	12 541	10 173	10 345	8 937	12 138	11 438	9 440	9 663	12 650	.
Grass and clover	647 162	634 860	613 966	599 608	577 306	561 855	542 208	528 917	532 723	531 022	519 105	500 525	467 838	.
Permanent grassland	370 829	364 546	343 145	342 507	358 461	331 639	328 053	324 836	326 238	323 042	307 842	297 614	299 458	.
D. Total grass and green forage	1039 922	1018 149	979 899	969 142	968 458	920 407	897 762	878 659	886 404	881 136	854 740	828 097	800 172	934 000
Seed for field crops	59 620	63 020	57 955	62 816	62 274	52 107	58 950	60 914	61 429	63 538	54 972	54 789	52 972	60 000
Seed for industrial crops	12 841	14 485	19 290	25 348	40 929	23 446	29 640	34 289	30 371	31 062	26 876	22 510	20 608	50 000
Other plants	3 128	2 162	3 020	3 311	1 825	1 917	1 839	1 390	1 135	1 013	639	195	271	.
E. Seed and other plants - total	75 589	79 667	80 265	91 475	105 028	77 470	90 429	96 593	92 935	95 613	82 487	77 494	73 851	110 000
F. Fallow land	4 580	5 895	3 602	4 243	5 537	2 940	3 606	3 262	3 103	2 842	1 580	2 081	1 774	2 000
G. Horticultural products	9 063	9 968	10 204	11 064	10 909	15 645	14 431	12 198	13 140	9 794	9 551	9 573	10 788	10 000
Total agricultural area	3115 759	3108 267	3094 125	3127 963	3110 221	2058 117	3037 744	3001 299	2994 837	2990 195	2983 035	2957 021	2941 316	2850000

[a]Projection.

Source: Danmarks Statistik, Landbrugsstatistik, Copenhagen, 1967, 1969, 1970.

Table 35* - Agricultural area in Denmark (%) 1958-1970, 1977[a]

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Wheat	2.5	2.3	2.7	3.4	4.9	4.4	4.2	4.2	3.1	3.0	3.2	3.3	3.9	3.5
Rye	3.9	3.9	5.1	5.8	5.6	3.8	3.0	2.9	1.5	1.3	1.3	1.3	1.5	0.9
Barley	23.1	24.2	24.4	25.6	26.7	30.7	31.3	34.7	37.1	39.1	42,0	44.1	46,0	42.1
Oats	6.5	6.6	6.4	6.2	5.3	6.1	6.9	6.8	7.8	8,1	7,3	6.9	6.3	6.0
Meslin	8.6	8.5	8.1	8.1	7.1	6,4	6.1	4.6	4.0	3.3	2.6	2.0	1.5	-
A. Total grain	44.7	46.0	46.7	49.1	49.6	51.3	51.6	53.2	53.6	54.8	56.5	57.6	59.1	52.6
B. Pulses	0.2	0,2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0,2	0.4	0,9	0,9	1.1
Potatoes	2.7	2,8	3.0	2.3	2.0	2.1	1.8	1.4	1.4	1.3	1.2	1.1	1.3	1.0
Sugar beet for sugar production	2.9	1,8	1.8	1.2	1.3	2.3	2.8	2.0	1.9	1.8	1.7	1.8	1.6	1.4
Sugar beet as feed	1.8	1,7	1.8	1.7	1.7	1.3	1.2	1.1	1.0	1.0	1.1	1,3	1.6	6,9
Half sugar mangel	4.6	4,8	5.0	4.9	4.4	4.3	4.4	4.5	4.2	4,1	3.9	3.9	3,8	
Fodder beet, turnips	0.6	0,6	0.6	0.5	0.3	0.2	0.2	0.1	0.1	0,1	0.1	0.1	0,1	
Swedes	6.3	6.3	6.3	5.6	5.2	5.1	4.9	4.6	4.5	3,7	3,2	2,4	1,5	
C. Total root crops	18.9	18.0	18.3	16.2	15.1	15.2	15.1	13.7	13.1	11.9	11.3	10.5	9.8	9.3
Lucerne	0.6	0.5	0.5	0,6	0.6	0.5	0,6	0.5	0.5	0.5	0.6	0.7	0,7	.
Green forage	0,1	0.1	0.2	0,3	0.4	0.3	0.3	0,3	0.4	0.4	0.3	0,3	0,4	.
Grass and clover	20,8	20.4	19.8	19,2	18.6	18,4	17,8	17.6	17,8	17,8	17.4	16,9	15,9	.
Permanent grassland	11.9	11.7	11.1	10.9	11.5	10.8	10.8	10,8	10.9	10.8	10.3	10,1	10.2	.
D. Total grass and green forage	33,4	32.8	31.7	31.0	31.1	30.1	29.6	29.3	29.6	29.5	28.7	28,0	27.2	32,8
Seed for field crops	1.9	2.0	1.9	2.0	2,0	1,7	1,9	2,0	2,1	2,1	1,8	1.9	1.8	1,8
Seed for industrial crops	0.4	0,5	0,6	0,8	1,3	0.8	1,0	1,1	1.0	1,0	0.9	0.8	0.7	2,1
Other plants	0,1	0,1	0.1	0.1	0,1	0.1	0,1	-	-	-	-	-	-	-
E. Seed and other plant - total	2.4	2.6	2,6	2.9	3,4	2,5	3.0	3,2	3.2	3,2	2,8	2,6	2,5	3,9
F. Fallow land	0.1	0,2	0.1	0,1	0,2	0.1	0,1	0.1	0.1	0,1	0.1	0,1	0.1	0.1
G. Horticultural products	0.3	0,3	0,3	0.4	0,4	0.5	0.5	0,4	0.4	0,3	0,3	0,3	0.4	0.4
Total agricultural area	100.0	100.0	100.0	100.0	100,0	100,0	100,0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]Projection.

Source: Calculated from Table 34*

Table 36* - Harvests in Denmark 1958-1970, 1977[a] ('000 tons)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Wheat	274	364	320	434	644	495	541	564	400	421	464	429	512	480
Rye	306	289	454	514	513	319	292	265	136	118	131	126	134	102
Barley	2 485	2 338	2 801	2 808	3 299	3 399	3 900	4 125	4 159	4 382	5 047	5 255	4 813	4 792
Oats	648	568	681	684	609	671	821	780	864	904	863	765	631	663
Meslin	752	602	727	759	719	619	659	479	401	328	280	200	142	-
A. Total grain	4 465	4 161	4 983	5 199	5 784	5 503	6 213	6 213	5 960	6 153	6 785	6 775	6 232	6 037
B. Pulses	15	13	20	24	14	15	15	8	5	22	49	77	93	.
Potatoes	1 558	1 731	1 963	1 490	1 162	1 334	1 213	937	972	857	866	663	1 033	700
Sugar beet for sugar production	3 240	1 593	2 230	1 397	1 440	2 598	3 154	1 883	2 159	2 139	2 148	1 960	1 892	1 680
Sugar beet as feed	2 311	1 638	2 580	2 290	1 967	1 656	1 603	1 136	1 344	1 462	1 655	1 572	2 203	.
Half sugar mangel	6 698	5 097	8 116	7 268	5 577	6 189	6 506	5 378	6 488	6 246	6 484	5 168	5 899	.
Fodder beet, turnips	982	584	964	683	474	311	239	197	171	122	217	135	151	.
Swedes	11 541	8 793	12 326	11 232	9 244	9 574	9 642	8 367	8 682	6 976	5 992	2 992	2 706	.
C. Total root crops	26 330	19 436	28 179	24 360	19 864	21 662	22 357	17 898	19 816	17 802	17 362	12 490	13 884	.
Yields per hectare (100 kg per ha)														
Wheat Winter	.	.	.	.	45.1	39.2	45.6	46.9	44.3	49.4	50.4	46.3	47.7	48.0
Wheat Spring	35.6	41.3	39.0	41.2	32.8	31.3	35.4	36.2	36.9	38.6	41.5	37.2	38.1	
Rye Winter	.	.	.	.	29.7	27.8	31.8	30.3	29.9	31.8	34.4	33.4	30.1	34.0
Rye Spring	25.0	23.9	29.0	28.1	25.3	24.2	26.1	26.8	25.3	28.3	27.4	25.2	28.9	
Barley	34.5	31.1	37.1	35.1	39.8	36.2	41.0	39.6	37.4	37.5	40.2	40.3	35.6	40.0
Oats	31,9	27.8	34.3	35.0	37.1	36.1	39.0	38.3	37.0	37.2	39.6	37.4	34.2	39.0
Meslin	28.0	22.8	28.9	29.9	32.6	31.7	35.4	34.7	33.6	33.7	35.8	34.5	31.9	-
Potatoes	188	199	213	206	187	208	223	231	240	229	247	198	279	250
Sugar beet for sugar production	355	288	407	361	344	375	376	312	375	407	412	376	400	420
Sugar beet as feed	414	308	472	431	365	427	454	356	465	490	513	423	481	.
Half sugar mangel	471	338	528	475	405	473	492	399	512	507	551	451	526	.
Swedes	590	449	635	646	567	616	653	605	646	629	625	430	615	.

[a]Projection.

Source: Danmarks Statistik, Landbrugsstatistik, Copenhagen, 1967, 1969, 1970.

Table 37* - Harvests in Denmark 1958-1970, 1977[a] (million feed units[b])

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Wheat	274	364	320	434	644	495	541	564	400	421	464	429	512	.
Rye	306	289	454	514	513	319	292	265	136	118	131	126	134	.
Barley	2 485	2 338	2 801	2 808	3 299	3 399	3 900	4 125	4 159	4 382	5 047	5 255	4 813	.
Oats	540	473	567	570	507	559	684	649	720	753	719	637	526	.
Meslin	684	547	662	690	654	563	599	436	365	298	254	182	129	.
A. Total grain	4 289	4 011	4 804	5 016	5 617	5 335	6 016	6 039	5 780	5 972	6 615	6 629	6 114	.
B. Total straw	988	806	1 066	1 173	1 223	1 133	1 173	1 095	1 060	1 020	1 033	1 121	868	.
C. Total pulses	15	13	20	24	14	15	15	8	5	19	46	74	88	.
Potatoes	316	392	407	328	259	296	271	215	220	198	197	159	247	.
Sugar beet for sugar production	768	409	517	340	349	600	778	441	531	498	508	481	452	.
Sugar beet as feed	420	301	462	393	361	302	299	204	248	254	285	287	403	.
Half sugar mangel	998	827	1 207	1 066	889	958	1 025	817	1 009	887	954	838	949	.
Fodder beet, turnips	121	82	116	81	63	39	30	24	21	14	27	19	21	.
Swedes	1 274	965	1 283	1 171	1 066	1 060	1 123	943	957	744	584	337	293	.
D. Total root crops	3 897	2 976	3 992	3 379	2 987	3 255	3 526	2 644	2 986	2 595	2 555	2 121	2 365	.
Beet leaves for silage	273	210	356	338	344	352	457	451	484	393	416	356	436	.
Fresh beet leaves as feed	242	223	198	144	150	137	131	108	80	76	55	44	44	.
E. Total beet tops	515	433	554	482	494	489	588	559	564	469	471	400	480	.
Grass	4 080	3 602	3 515	4 092	4 027	3 806	4 139	4 122	4 231	4 143	4 105	3 160	3 305	.
Late hay from grain and seed areas	111	98	106	133	146	132	143	134	153	205	286	217	249	.
F. Total grass harvest	4 191	3 700	3 621	4 225	4 173	3 938	4 282	4 256	4 384	4 348	4 391	3 377	3 554	.
Total harvests	13 895	11 939	14 057	14 299	14 508	14 165	15 600	14 601	14 779	14 423	15 111	13 722	13 469	.

[a]Projection. [b]Purely Danish concept : 1 feed unit = 1 kg barley.

Source: Danmarks Statistik, Landbrugsstatistik, Copenhagen, 1967, 1969, 1970.

Table 38* - Yields per hectare in Denmark 1958-1970, 1977[a] (100 feed units per ha[b])

		1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Wheat	Winter	35.6	41.3	39.0	41.2	45.1	39.2	45.6	46.9	44.3	49.4	50.4	46.3	47.7	.
	Spring					32.8	31.3	35.4	36.2	36.9	38.6	41.5	37.2	38.1	.
Rye	Winter	25.0	23.9	29.0	28.1	29.7	27.8	31.8	30.3	29.9	31.8	34.4	33.4	30.1	.
	Spring					25.3	24.2	26.1	26.8	25.3	28.3	27.4	25.2	28.9	.
Barley		34.5	31.1	37.1	35.1	39.8	36.2	41.0	39.6	37.4	37.5	40.2	40.3	35.6	.
Oats		26.6	23.2	28.6	29.2	30.9	30.1	32.5	31.9	30.8	31.0	33.0	31.2	28.5	.
Meslin		25.5	20.7	26.3	27.2	29.6	28.9	32.2	31.6	30.5	30.6	32.6	31.3	29.0	.
A. Total grain		30.8	28.0	33.2	32.6	36.3	33.9	38.3	37.8	36.0	36.5	39.3	38.9	35.2	.
B. Total straw		7.1	5.6	7.3	7.6	7.9	7.2	7.5	6.8	6.6	6.2	6.1	6.6	5.0	.
C. Total pulses		20.4	21.5	23.7	23.6	16.1	20.0	24.5	22.4	24.0	29.1	36.2	28.8	33.1	.
Potatoes		38.2	45.1	44.2	45.3	41.7	46.2	39.8	52.8	54.5	52.8	56.3	47.4	66.5	.
Sugar beet for sugar production	root	84.2	73.9	94.4	88.1	83.4	86.8	92.8	73.1	92.2	94.8	97.4	92.4	95.5	.
	leaves	22.0	16.5	27.4	24.9	24.0	24.7	26.0	24.3	26.1	26.6	28.4	23.5	27.3	.
Sugar beet as feed	root	75.2	56.6	84.6	73.9	67.0	77.9	84.7	63.8	85.7	85.1	88.3	77.4	87.9	.
	leaves	19.7	16.5	24.0	22.4	22.7	22.0	29.6	24.4	27.0	27.2	25.8	19.6	27.9	.
Half sugar mangel	root	70.2	54.9	78.5	69.7	64.5	73.3	77.5	60.7	79.7	72.0	81.0	73.1	84.6	.
	leaves	17.4	14.6	19.4	17.4	19.3	18.8	21.3	22.1	23.0	19.6	20.8	17.7	21.9	.
Fodder beet, turnips	root	.	.	.	.	.	.	.	56.9	59.0	52.0	67.1	58.6	75.2	.
	leaves	14.4	12.0	15.1	14.1	15.6	15.9	18.0	21.1	17.9	15.1	15.9	14.1	17.8	.
Swedes	root	65.2	49.3	66.1	67.4	65.4	68.2	76.1	68.2	71.2	67.0	60.9	48.6	66.5	.
	leaves	5.1	4.3	5.6	6.6	5.8	5.9	6.7	7.2	7.3	6.4	5.8	5.5	5.3	.
D. Total root crops	root	66.3	53.2	70.4	66.9	63.7	70.1	77.0	64.5	76.3	72.8	75.8	68.4	81.8	.
	leaves	8.8	7.7	9.7	9.5	10.5	10.5	12.9	13.6	14.4	13.1	14.0	12.9	16.6	.
E. Grass		40.5	36.4	37.1	43.8	43.3	42.8	46.6	47.4	48.4	47.6	48.6	38.6	42.0	.

[a]Projection.

Source: Danmarks Statistik, Landbrugsstatistik 1900-1965, Bind I Landbrugsareal og hø̊tudbytte samt gødningsforbrug. Copenhagen, 1968.
Landbrugsstatistik, various issues.

Table 39* - Revenue, expenditure and gross income of Danish agriculture 1958-1970, 1977[a] (DKr '000 000)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1977[a]
Total production value	6 593	7 391	7 617	7 324	7 793	7 949	9 169	9 224	9 551	9 422	9 349	10 283	10 451	18 933
Total crop products	966	877	853	731	1 004	901	1 032	988	977	921	944	1 226	1 085	1 219
of which: Cereals	383	361	367	337	511	270	408	468	414	346	368	541	458	540
Sugar beet	275	139	187	120	134	256	301	174	230	223	248	242	245	240
Potatoes	162	193	138	99	179	192	101	128	149	126	119	209	132	89
Total animal products	5 659	6 604	6 592	6 429	6 644	7 315	8 015	8 144	8 641	8 617	8 519	9 066	9 752	17 714
Dairy farm products	1 516	2 106	1 912	1 932	1 964	2 187	2 357	2 514	2 608	2 722	2 696	2 782	2 984	6 135
Whole milk and cream	412	539	504	508	544	604	638	646	647	726	733	776	813	1 340
Skimmed milk and buttermilk	41	44	47	56	57	65	70	79	91	112	106	112	118	217
Butter	732	1 117	972	952	978	1 044	1 146	1 197	1 138	1 138	1 150	1 088	1 092	3 052
Cheese	331	406	389	416	385	474	503	493	557	555	468	518	559	1 526
Equalization payment	-	-	-	-	-	-	-	99	175	191	239	288	402	-
Eggs	540	482	443	397	315	387	320	330	320	315	319	308	290	313
Total meat	3 603	4 016	4 237	4 100	4 365	4 741	5 338	5 300	5 713	5 580	5 504	5 976	6 478	11 266
of which: Beef and veal	1 161	1 231	1 270	1 097	1 213	1 388	1 497	1 540	1 525	1 493	1 567	1 758	1 751	4 325
Pigmeat	2 263	2 564	2 706	2 713	2 857	3 079	3 539	3 495	3 920	3 853	3 689	3 959	4 428	6 332
Poultrymeat	141	162	196	234	255	236	269	233	241	211	226	239	278	589
Changes in stocks and in number of livestock	-32	-90	+172	+164	+145	-267	+122	+92	-67	-116	-114	-9	-386	.
Total inputs	1 864	2 413	2 533	2 295	2 612	2 562	3 034	3 066	3 306	3 191	3 038	3 045	3 528	.
Commercial fertilizers	389	408	450	410	444	489	514	562	584	623	603	652	669	.
Feedingstuffs	833	1 308	1 354	1 115	1 380	1 248	1 621	1 573	1 739	1 548	1 386	1 299	1 728	.
Fodder grain	320	553	566	350	534	281	489	403	550	480	329	193	469	.
Other feedingstuffs	513	755	788	765	846	967	1 132	1 170	1 189	1 068	1 057	1 106	1 259	.
Seed	69	84	97	114	96	103	107	102	103	93	90	97	106	.
Other raw materials and fuel	442	466	481	511	537	564	608	644	689	739	772	791	816	.
Services of other branches	131	147	151	145	155	158	184	185	191	188	187	206	209	.
General subsidies	-	-	-	267	286	269	297	119	189	184	205	187	267	.
Gross factor income including subsidies	4 729	4 978	5 084	5 296	5 467	5 656	6 432	6 277	6 434	6 415	6 516	7 425	7 190	.

[a]Projection.

Source: Danmarks Statistik. Landbrugsstatistik. Copenhagen, 1969, 1970.

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I R E L A N D

I. Analysis of the demand for foodstuffs

1. Model framework; methods of evaluation

The general framework used for the econometric analysis of the demand for foodstuffs in Ireland is, in principle, no different from that already comprehensively described for the United Kingdom and so a further description is superfluous (see the survey on the United Kingdom p. 2 et seq.). All that need be added is that the semi-logarithmic type of function was always used to describe the relationship between the demand for foodstuffs and income or prices:

$$(1) \quad Q = a + b \log C_{pr} + c \log P_1 + d \log P_2 + u$$

where:

Q = per capita consumption (in kg) of the product concerned

C_{pr} = private per capita consumer expenditure at current prices, divided by the consumer price index (1953 = 1.00) in £ (="real private per capita consumer expenditure")

P_1 or P_2 = nominal retail prices of the product concerned or of rival products, divided by the consumer price index (1953 = 1.00) in p per kg (="real retail prices")

u = residual fluctuations remaining unexplained.

The use of the semi-logarithmic type of function alone is the result of experience showing that similar types of functions which are normally also used to analyse the demand for foodstuffs (e.g. the simple inverse function or the logarithmically inverse function) generally give results

that differ only marginally from each other; for instance, the differences in the degrees of certainty or in the t test values of the partial regression coefficients, which are attributable only to the use of alternative types of functions, are usually not statistically significant. It was found that the introduction of a time variable to differentiate between short-term and long-term influences was not absolutely necessary and, therefore, in view, above all, of the considerable difficulties that can be caused by demand equations with a time variable in estimating (see the survey on the United Kingdom), versions with a time variable were no longer taken into account in the selection of the "best fit" according to both economic and also statistical and methodological criteria. The parameter estimates were produced without exception by the least squares method. It was assumed amongst other things that demand was affected by price but that the price itself was not, or was only insignificantly, affected by demand. This assumption should not be far removed from reality in so far as changes in the price of most foodstuffs from one year to the next are primarily influenced by supply fluctuations (e.g. because of certain weather conditions) and are affected to a lesser extent by the relatively constant development of demand. (See the survey on the United Kingdom for the other conditions relating to the use of the least squares method and for the statistical checks).[1]

2. Results of the statistical examination of the demand functions

a. Wheat flour

Consumption of wheat flour can be satisfactorily accounted for by income trends (consumption of bread declines as income increase and shifts principally to certain processed animal products):

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[1] It should merely be pointed out that the values given in brackets under the partial regression coefficients are t test values, that D.W. is the Durbin-Watson Statistic used to check the empirical results for autocorrelation and that $\bar{e}$ is the relative estimated error of the equation (absolute standard error in the estimate as a percentage of the arithmetical mean of the dependent variables).

Period: 1958-70

(2) $Q = + 372.83 - 129.37 \log C_{pr}$
(8.5)

r^2 : 0.868 D.W. : 1.00 $\frac{\hat{\sigma}}{Q} = 3.4\%$

Income elasticity: -0.66

where:

Q = per capita consumption of wheat flour (kg product weight)

The additional inclusion of the price of white bread brought no appreciable improvement. The relatively low Durbin-Watson figure must be viewed in relation to the inadequate statistical data amongst other things: the consumption of wheat flour had to be estimated almost exclusively on the basis of the milling industry's production statistics; "adjustment" by the (in any case small) foreign trade in flour and products containing flour was only possible to a limited extent and, in the case of stocks, was impossible.

b. Potatoes

An analysis of the demand for ware potatoes showed that surprisingly enough it is still slightly sensitive to price changes - a phenomenon that is already a thing of the past in some other industrialized Western countries with a higher income level than Ireland:

Period 1958-70

(3) $Q = + 435.21 - 124.77 \log C_{pr} - 25.352 \log P_1$
(7.1) (1.9)

R^2 : 0.848 D.W. : 1.48 $\frac{\hat{\sigma}}{Q} = 2.2\%$

Income elasticity: - 0.36; direct price elasticity: - 0.07

where:

Q = per capita consumption of ware potatoes in general (kg)

P_1 = real retail price of ware potatoes (p per kg)

The most prominent characteristic of the demand for ware potatoes in Ireland is in any case the negative reaction to the growth in incomes.

c. Sugar

It was found useful to analyse sugar demand separately according to direct consumption ("household consumption") and indirect consumption ("industrial consumption"):

Period: 1960–70

(4) $Q = +139.51 - \underset{(4.2)}{42.211} \log C_{pr} - \underset{(1.4)}{22.123} \log P_1$

$R^2 : 0.708$ D.W. : 3.31 $\frac{\hat{\sigma}}{Q} = 4.0\%$

where:

Q = per capita consumption of "household sugar" (kg white sugar value)

P_1 = real retail price for refined granulated sugar (p per kg)

Period: 1960–69

(5) $Q = -152.73 + \underset{(4.6)}{77.968} \log C_{pr}$

$r^2 = 0.725$ D.W. : 2.27 $\frac{\hat{\sigma}}{Q} = 9.6\%$

Income elasticity: + 1.58

where:

Q = per capita consumption of "industrial sugar" (kg white sugar value)

As was to be expected, there was still a clear sensitivity to price changes in the case of direct household consumption. The negative income elasticity of direct consumption is accounted for mainly by the diversification or refinement (dependent on income) of the general consumption of foodstuffs, which, amongst other things, encourages the consumption of products containing sugar that have undergone a relatively

high degree of processing (for example sweets and confectionery). This process in fact amounts to no more than a gradual shift of sugar consumption from the household to industry. The income elasticity of indirect consumption, therefore, takes a plus sign and is also extremely high. Even the "missing" price influence for industrial sugar is fully in accordance with the a priori considerations: The use of sugar in products containing sugar by the industry concerned is not, or only to a very minor extent, governed by the cost price of sugar but almost exclusively by the price and sales expectations for the end products. In view of the great variety of products containing sugar, the introduction of the price of these end products into the equation for determining indirect sugar consumption would be neither possible nor sensible if one considers the price movements for the individual end products, which probably cancel each other out to a large degree.

d. Meat and meat products

The demand for beef can be satisfactorily accounted for by income, the price of beef and the price of the type of meat which, as regards, consistency and taste, bears the greatest resemblance to beef, but is considerably cheaper, namely mutton:

Period: 1958-70

(6) $Q = -55.435 + \underset{(7.9)}{36.053} \log C_{pr} - \underset{(2.5)}{21.240} \log P_1 + \underset{(1.4)}{16.734} \log P_2$

R^2 : 0.944 D.W. : 1.79 $\frac{\hat{\sigma}}{Q} = 2.4\%$

Income elasticity: + 0.95; direct price elasticity: - 0.56; cross-price elasticity: + 0.44

where:

Q = per capita consumption of beef (kg slaughter weight)

P_1 and P_2 = real retail price for "round steak" and leg of mutton respectively (p per kg)

The most important substitute for mutton is not, as equation (6) would lead one to expect, beef, but bacon, even though good-quality bacon in Ireland up to 1969 was always slightly more expensive than leg of mutton, but cheaper than beef (steak):

Period: 1958-70

(7) $Q = -16.568 + \underset{(3.1)}{16.038 \log C_{pr}} - \underset{(3.2)}{21.962 \log P_1} + \underset{(1.5)}{15.758 \log P_2}$

R^2 : 0.705 D.W. : 1.98 $\frac{\hat{\sigma}}{Q} = 3.5\%$

Income elasticity: + 0.65; direct price elasticity: - 0.89; cross-price elasticity: + 0.64

where:

Q = per capita consumption of mutton and lamb (kg slaughter weight)

P_1 and P_2 = real retail prices for leg of mutton and for bacon (streaky rashers) respectively (in p per kg)

A comparison of (6) and (7) shows clearly that beef comes above mutton on the scale of preferences of the Irish consumer: in absolute terms the income elasticity of beef is 1.5 times and the direct price elasticity only 0.63 times those for mutton.

The demand for <u>pork</u> cannot be satisfactorily accounted for by income and the price of pork; even the inclusion of the price of mutton brings only a marginal improvement:

Period: 1959-70

(8) $Q = +71.951 - \underset{(0.3)}{3.4672 \log C_{pr}} - \underset{(1.1)}{38.677 \log P_1}$

R^2 : 0.351 D.W. = 0.99 $\frac{\hat{\sigma}}{Q} = 12.1\%$

Income elasticity: - 0.24; direct price elasticity: - 2.63

Period: 1959-70

$$(9)\quad Q = +64.253 - \underset{(0.3)}{3.6011}\log C_{pr} - \underset{(1.0)}{36.912}\log P_1 + \underset{(0.2)}{3.6008}\log P_2$$

R^2 : 0.355 D.W.: 0.93 $\frac{\hat{\sigma}}{Q} = 12.8\%$

Income elasticity: - 0.25; direct price elasticity: - 2.51; cross-price elasticity: + 0.24

Where:

Q = per capita consumption of pork (kg slaughter weight)

P_1 and P_2 = real retail prices of shoulder of pork and leg of mutton respectively (p per kg)

The low t test values in (8) and (9) result from both the low degree of certainty and the high intercorrelation (simple correlation coefficient between income and the price of pork: - 0.92). The extremely strong price sensitivity (in absolute terms) of the demand for pork resulting from the two equations is surprising. The negative income elasticity does not fit in with the theoretical expectations. On the one hand, the fact that pork consumption was estimated as a residual value accompanied by considerable errors could have something to do with these results. On the other, it must be borne in mind that the consumption of fresh pork in Ireland was, until the end of the fifties, almost entirely restricted to the few large urban areas and was also subject to substantial seasonal variations. With more and more households in the medium and lower-income bracket, whether in the larger towns and in small rural communities, acquiring refrigerators, there has, since the beginning of the sixties, been a rapid increase in pork consumption especially in predominantly agricultural areas, along with a simultaneous reduction in the seasonal variations in demand.[1] Since this process has not been constant but has evolved in leaps

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[1] Department of Agriculture, Report of the Survey Team established by the Minister of Agriculture on the Bacon and Pigmeat Industry. Dublin, Stationery Office, April 1963, p. 67.

and bounds (particularly in the initial stages), it cannot be suitably represented by the value C_{pr}.

The demand for <u>bacon</u> is affected by income, the price of bacon and the price of eggs as a complementary product; the most important substitute for bacon is mutton. For reasons of multicollinearity, however, the effects of the above factors on bacon consumption cannot be incorporated in one equation:

Period: 1959–70

(10) $Q = + 48.339 + \underset{(0.8)}{12.215} \log C_{pr} - \underset{(1.4)}{30.559} \log P_1 - \underset{(1.0)}{8.2819} \log P_2$

R^2 : 0.901 D.W. : 1.82 $\frac{\hat{\sigma}}{Q} = 3.8\%$

Income elasticity: + 0.28; direct price elasticity: - 0.71; elasticity with reference to price of eggs: - 0.19

Period: 1959–70

(11) $Q = + 24.017 + \underset{(0.8)}{7.4853} \log C_{pr} - \underset{(2.8)}{45.577} \log P_1 + \underset{(3.0)}{32.423} \log P_2$

R^2 : 0.948 D.W. : 1.64 $\frac{\hat{\sigma}}{Q} = 2.8\%$

Income elasticity: + 0.17; direct price elasticity: - 1.05; cross-price elasticity: + 0.75

where:

Q = per capita consumption of bacon (kg slaughter weight)

P_1 = real retail price for bacon (streaky rashers) in p per kg

P_2 = in equation (10): real retail price for hen eggs (standard) in p per dozen

P_2 = in equation (11): real retail price for leg of mutton (p per kg)

The low t test values in equation (10) are due solely to the very high multicollinearity (the simple correlation coefficients between the explanatory variables are in the absolute range of 0.86 to 0.93); in

addition, (10) accounts satisfactorily for the bacon demand, as can be seen from the high degree of certainty and the D.W. figure. The same applies to the regression coefficient of C_{pr} in (11) (simple correlation coefficient log C_{pr}/log P_1: - 0.93). The result obtained from (11) corresponds to the results from (7): mutton is an important substitute for bacon and vice versa. The strong sensitivity to price changes and significantly positive income elasticity indicate that in Ireland bacon is a product whose sales do not, as in the United Kingdom, depend primarily on traditional consumption habits, but which tends to have an important influence in determining the "dynamics" of meat consumption in general. (It should be mentioned here that of all the types of meat eaten in Ireland bacon in by far the most important).

An attempt to account satisfactorily for the demand for poultrymeat is impeded by the fact that official Irish statistics provide no information on the retail, wholesale or market prices for poultry. All that is given is a time series of market prices for "chickens per pair" (live), but without any details of weight (in any case it must be assumed that these are birds for breeding rather than for fattening):

Period: 1958-70

(12) $Q = -74.425 + \underset{(11.3)}{36.628 \log C_{pr}}$

R^2 : 0.921 D.W. : 0.66 $\frac{\hat{\sigma}}{Q} = 8.5\%$

Income elasticity: + 2.24

where:

Q = per capita consumption of poultrymeat of all kinds (kg)

With the very high income elasticity it must be noted that this includes the undoubtedly very positive price effect since the introduction of broiler production in 1960 (trend towards probably very sharply declining real retail prices for poultry).

The demand for edible offals (liver, heart, kidneys, etc.) appears to be influenced, above all, by income. In addition, the prices for ox and sheep's liver appear to play a certain part:

Period: 1958–70

(13) $Q = -15.435 + 21.430 \log C_{pr}$
(5.4)

R^2 : 0.750 D.W. : 1.16 $\frac{\hat{\sigma}}{Q} = 7.3\%$

Income elasticity: + 0.92; direct price elasticity: - 0.69

where:

Q = per capita consumption of edible offals (kg)

P_1 = average real retail price of ox or sheep's liver (p per kg)

To obtain information on the factors determining the demand for <u>meat in general</u>, an average meat price was constructed representing the arithmetical mean of the prices for beef, mutton, pork, bacon and liver. The fact that the meat price obtained in this way does not include the price of poultrymeat, on which we have no information (see above), must be considered an important shortcoming. Nevertheless, it was possible to account satisfactorily for meat demand by means of income, the price of meat excluding poultrymeat and the price of fish as the most important substitute for meat:

Period 1958–70

(14) $Q = -204.64 + 125.16 \log C_{pr} - 35.494 \log P_1 + 38.672 \log P_2$
(12.5) (1.0) (1.4)

R^2 : 0.982 D.W. : 1.99 $\frac{\hat{\sigma}}{Q} = 1.7\%$

Income elasticity: + 0.78; direct price elasticity: - 0.22; cross-price elasticity: + 0.24

where:

Q = per capita consumption of meat in general (including poultry) in kg slaughter weight

P_1 and P_2 = real retail price for meat (see above for explanation) and for fish (whiting) respectively, in p per kg

It is striking to see the high income elasticity and the very slight price sensitivity of the demand for meat, which can be interpreted as meaning that in the years after the Second World War a large backlog demand for meat built up (from 1958 to 1970 per capita meat consumption rose by 43%).

e. Milk and milk products

The analysis of the demand for liquid milk showed no significant influence by either income or the price of liquid milk so that we have to assume that the consumption of liquid milk is determined largely by traditional consumption habits. Account must be taken of the fact that in Ireland, with the exception of whole milk powder for baby foods, there is virtually no direct substitute for liquid milk (for example, condensed milk is produced solely for export as there is no domestic demand for it).

Consumption of fresh cream reacts strongly to changes in income; possibly price also has some influence. This assumption could not be tested, however, as no data are available on the retail price of fresh cream:

Period: 1958-70

(15) $Q = -24.510 + \underset{(7.9)}{13.138} \log C_{pr}$

$r^2 : 0.874$ D.W. : 2.09 $\frac{\hat{\sigma}}{\bar{Q}} = 4.7\%$

Income elasticity: + 1.16

where:

Q = per capita consumption of fresh cream (kg whole milk equivalent)

In interpreting this elasticity coefficient, account must, therefore, be taken of the fact that possibly price influences are included.

Chocolate crumb is an industrial semi-product, the consumption of which is influenced, like "industrial sugar", primarily by the processor's price and sales expectations for the end product (confectionery of all

types) and, to a very small extent, by the purchase price. As no representative price for confectionery is available and as, in any case, it is to be expected that the demand for confectionery is predominantly dependent on income, chocolate crumb consumption must be accounted for solely by income:

Period: 1960–69

(16) $Q = -57.934 + \underset{(8.6)}{27.209} \log C_{pr}$

R^2 : 0.902 D.W. : 0.98 $\frac{\hat{\sigma}}{\bar{Q}} = 13.5\%$

Income elasticity: + 4.16

where:

Q = per capita consumption of chocolate crumb (kg product weight)

The low D.W. figure must be viewed inter alia in conjunction with the fact that the proportion of chocolate crumb in total consumption of confectionery may fluctuate considerably from one year to the next depending on its apportionment amongst the individual types of confectionery.

The demand for <u>creamery butter</u> is to be accounted for by income and the price ratio (butter : margarine) :

Period: 1958–70

(17) $Q = + 26.496 - \underset{(1.3)}{5.3853} \log C_{pr} - \underset{(0.7)}{5.2907} \log P_1$

R^2 : 0.17 D.W. : 1.14 $\frac{\hat{\sigma}}{\bar{Q}} = 3.8\%$

Income elasticity: - 0.18; elasticity compared with price ratio: - 0.19

where:

Q = per capita consumption of creamery butter (kg fresh weight)

P_1 = price ratio $(\frac{\text{creamery butter}}{\text{margarine}})$

The very low degree of certainty results from the fact that the consumption of creamery butter underwent only marginal variations in the period under review. Otherwise, the signs and the absolute value of the elasticity coefficients obtained and D.W. figure appear to indicate that in (17) the income and price influences of butter consumption are in general correctly demarcated. The negative income elasticity could be attributable to the fact that butter consumption in Ireland had already reached a certain saturation limit at the beginning of the period under review; at 16-17 kg per capita per annum, Ireland had the highest level of butter consumption in the world after New Zealand.

The predominant factor determining the demand for <u>farm butter</u> can be seen in the income trend:

Period: 1958-70

(18) $Q = +58.676 - \underset{(10.3)}{25.217} \log C_{pr}$

$r^2 : 0.907$ D.W. : 0.73 $\frac{\hat{\sigma}}{\bar{Q}} = 17.9\%$

Income elasticity: - 4.30

where:

Q = per capita consumption of farm butter (kg fresh weight)

The very high negative income elasticity of "demand" for farm butter is dependent both on quality (in comparison to creamery butter) and, above all, on supply (sharp decline in the production of farm butter for reasons of economical working). In addition to creamery butter, margarine profited greatly from the decline in the consumption of farm butter.

The demand for <u>cheese</u> can be accounted for satisfactorily by income alone. We could not detect any significant influence of the price of natural or processed cheese on cheese consumption. Account must be taken of the fact that at the beginning of the period under review cheese was still consumed in very small quantities and irregularly, especially in rural areas (national per capita consumption 1958/60: 1.1 kg). Intensive advertising campaigns by the National Dairy Council and the Irish Milk Marketing Board

(An Bord Bainne) brought about a certain change in these consumption habits which was not price-induced:[1]

Period: 1958-70

(19) $Q = -15.961 + 7.9215 \log C_{pr}$
(18.7)

r^2 : 0.969 D.W. : 2.49 $\frac{\hat{\sigma}}{Q} = 4.8\%$

Income elasticity: + 2.06

where:

Q = per capita consumption of cheese (kg)

f. Eggs and egg products

The demand for fresh eggs is subject to conditions similar to those applying to the demand for creamery butter: at almost 300 eggs per capita per annum, demand had obviously reached saturation point at the beginning of the period under review and since then the long-term trend has shown a sharp decline, with the respective level of the price of eggs playing no part. Perceptible temporary deviations from this trend may, however, be caused by changes in the price of or demand for bacon, with bacon acting as a "leader" for eggs:

Period: 1958-70

(20) $Q = +1479.3 - 488.39 \log C_{pr} - 87.741 \log P_1$
(10.5) (0.9)

R^2 : 0.983 D.W. : 1.66 $\frac{\hat{\sigma}}{Q} = 1.4\%$

Income elasticity: - 0.82; elasticity compared with price of bacon: - 0.15

where:

Q = per capita consumption of shell eggs (numbers)

P_1 = real retail price of bacon (streaky rashers) in p per kg

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[1] Department of Agriculture, Report of the Survey Team established by the Minister for Agriculture on the Dairy Products Industry, Dublin, Stationery Office, February 1963, p. 94 et seq; Annual Report of the Minister for Agriculture and Fisheries 1970-71, Dublin, Stationery Office, p. 46

The consumption of egg products was determined solely by the income trend - for the same reasons as in the case of "industrial sugar" or chocolate crumb:

Period: 1958-70

$$(21)\quad Q = -58.338 + \underset{(3.6)}{34.444} \log C_{pr}$$

r^2 : 0.56 D.W. = 2.75 $\frac{\hat{o}}{Q} = 8.9\%$

Income elasticity: + 0.83

where:

Q = per capita consumption of egg products in shell egg equivalent (numbers)

g. Fruit and vegetables

The attempt to account for the demand for fresh tomatoes by income and the price of fresh tomatoes produced no acceptable results. This could be due to the fact that the estimate of the total consumption of tomatoes contains substantial statistical errors resulting from over-estimating both the areas under cultivation and the yields of glasshouse tomatoes.[1] An econometric analysis of the demand for dessert and cooking apples also failed because of the inadequate statistical data on domestic production and also because there are generally no price details available for apples (this applies to both retail and producer prices).

[1] See: E.T. Gibbons, M.J. Harkin and F.K. O'Neill, The Irish Tomato Industry, Dublin, December 1970, p. 26.

Table 1 - Estimated income and price elasticities of the demand for foodstuffs in Ireland

Product	Income elasticity[a]	Direct price elasticity[a]	Cross price elasticity[a]	Compared with:	Calculated in equations:
Wheat flour	- 0.66				(2)
Potatoes	- 0.36	- 0.07			(3)
White sugar - direct household consumption	- 0.65	- 0.34			(4)
White sugar - industrial consumption	+ 1.58				(5)
Beef	+ 0.95	- 0.56	+ 0.44	Mutton	(6)
Mutton	+ 0.65	- 0.89	+ 0.64	Bacon	(7)
Pork I	- 0.24	- 2.63			(8)
Pork II	- 0.25	- 2.51	+ 0.24	Mutton	(9)
Bacon I	+ 0.28	- 0.71	- 0.19	Eggs	(10)
Bacon II	+ 0.17	- 1.05	+ 0.75	Mutton	(11)
Poultrymeat	+ 2.24[b]				(12)
Edible offals	+ 0.92	- 0.69			(13)
Meat - total	+ 0.78	- 0.22	+ 0.24	Fish	(14)
Fresh cream	+ 1.16[b]				(15)
Chocolate crumb	+ 4.16				(16)
Creamery butter	- 0.18	- 0.19[c]			(17)
Farm butter	- 4.30				(18)
Cheese	+ 2.06				(19)
Fresh eggs	- 0.82		- 0.15	Bacon	(20)
Egg products	+ 0.83				(21)

[a]Given as an arithmetical mean. [b]Probably contains positive price influence; "actual" income elasticity, therefore, probably lower (for details cf. text). [c]Price ratio ("creamery butter : margarine").

Source: Own calculations and estimates.

II. Forecast of the demand for foodstuffs

1. Hypotheses on the income, population growth and consumer price trends up to 1977

The hypotheses on income and population trends and on the trend in the general price level are given in Table 2. The growth rate of real private consumer expenditure in the period under review was subject to severe cyclical fluctuations, but a rising trend predominated in the long term: average 1959-65: 3.2%, average 1966-70: 4.0%. This was due not least to the deliberate stimulation of economic growth under the First and Second Programmes for Economic Expansion, aimed chiefly at increasing farm exports in order to improve import capacity for capital goods and at continuously promoting industrial development by attracting foreign industrial companies to the country (foreign companies were granted very generous tax concessions and other subsidies to this end). At the same time this was intended to reduce the unemployment level, still relatively high, and the resulting loss of labour due to emigration (to the U.S.A. and the United Kingdom). Under Community conditions, Ireland can count on substantially improved prices and markets for its farm products. Investments by companies from other Community countries - in particular firms from Germany and France - could be given new impetus by Ireland's accession to the Community for a number of reasons. Even the willingness of U.S. firms to invest in Ireland is likely to increase after accession, the main attraction being the possibility of the respective Irish subsidiaries functioning as the Community branch of their business. In addition to the concessions granted by the Irish Government, the most important reason for foreign companies to establish a subsidiary there, is probably the very much lower wage levels in Ireland compared to other EEC countries, let alone the U.S.A. Even under Community conditions, this difference in the wage levels between Ireland and the other Member States or the U.S.A. is likely to continue for some considerable time. On the basis of these considerations, we have assumed that the rapid economic growth in the years following 1965 will continue unabated in the period from 1971 to 1977 - a somewhat pessimistic assumption.

Table 2 - Hypotheses on income, population and price trends in Ireland up to 1977

Year	Private consumer expenditure at current prices (£m)	Consumer price index (1953 = 100)	Growth rate of consumer price index (%)	Private consumer expenditure divided by consumer price index (£m)	Growth rate of real private consumer expenditure (%)	Population	Population growth rate (%)	Real private consumer expenditure per capita (£)
1958	459.1	1,165	.	394.1	.	2.853	.	138.1
1959	467.2	1.165	0	401.0	1.8	2.846	- 0.25	140.9
1960	497.8	1.170	0.4	425.5	6.1	2.832	- 0.49	150.3
1961	523.5	1.202	2.7	435.5	2.4	2.818	- 0.49	154.6
1962	563.7	1.253	4.2	449.9	3.3	3.824	0.21	159.3
1963	599.8	1.284	2.5	467.1	3.8	2.841	0.60	164.4
1964	668.1	1.370	6.7	487.7	4.4	2.849	0,28	171.2
1965	705.1	1.439	5.0	490.0	0,5	2.873	0.84	170.5
1966	747.3	1.482	3.0	504.3	2.9	2.884	0.38	174.8
1967	795.0	1.529	3.2	519.9	3.1	2.899	0.52	179.3
1968	902.0	1.601	4.7	563.4	8.4	2.910	0.38	193.6
1969	1 010.0	1.720	7.4	587.2	4.2	2,925	0.52	200.8
1970	1 110.0	1,861	8.2	596.5	1,6	2,940	0,51	202.9
1971	.	2.028	9.0	620.4	4,0	2.955	0.50	209.9
1972	.	2.150	6,0	645.2	4.0	2,970	0.50	217.2
1973	.	2.279	6.0	671.0	4,0	2.985	0.50	224.8
1974	.	2.416	6,0	697.8	4,0	3.000	0,50	232.6
1975	.	2.561	6.0	725.7	4,0	3.015	0.50	240,7
1976	.	2.715	6.0	754.7	4.0	3,030	0.50	249.1
1977	.	2.878	6.0	784.9	4.0	3.045	0,50	257.8

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Own calculations and estimates.

The stimulation of economic growth during the First and Second Programmes for Economic Expansion led in the years after 1960 to very high rates of price increases for the conditions at that time: 6.7% in 1964 and 5.0% in 1965. The extremely sharp rise in the rate of inflation from 4.7% (1968) to 9.0% (1971) was probably primarily due to imported inflation from the United Kingdom, although the entry into force of the Anglo-Irish Free Trade Agreement in 1966 did have some influence. Under Community conditions the "inflation community" with Great Britain is likely to become even more tightly knit. For the United Kingdom we took the annual rate of price increases to be 5.2% from 1972 to 1977; for Ireland we shall take a similar inflation rate, but the higher price increases that have already occurred in Ireland in the period under review must also be taken into account (1966-71 7.3% per annum; hypotheses for 1971-77 6.0% per annum). To prevent misunderstandings it should be added that, compared with the most recent developments, the rate of price increases assumed for Ireland seems too low by at least 1 - 2%, as does the rate of inflation "given" for the United Kingdom. In fact, we also expect that currency erosion in Ireland in the coming years will take place at a faster rate than is assumed in Table 2. This "manipulation" is intended to offset to some degree the exchange rate of the Irish pound (which, whether we like it or not, was undervalued) against the old U.S. dollar (and, therefore, the unit of account too - cf. Table 3), since it is assumed that in the future too, the Irish Government will not permit any variations in the rate of exchange between the Irish and British pounds for economic reasons (£1 Irish = £1 British = 2.4 units of account - this was the parity of the pounds before the rate was allowed to float on 23 June 1972). The fact that we have not explicitly taken into account the de facto devaluation of the Irish and British pounds which has taken place since mid-1972 does affect, all other things being equal, the hypotheses on the nominal producer prices and causes them to be too low. To some extent, this can be offset at the level of real retail prices (cf. II, 2, c) by assuming a correspondingly low inflation rate (consumer price index) (a more detailed explanation of the problems connected with this is given in the United Kingdom study).

Up to 1961 the resident population of Ireland tended to decline because of the high emigration rate. Only since 1962 has there again been a modest increase which is not due to an increase in the natural birth rate but to a fall in emigration as a result of the provision of additional and more attractive jobs under the First and Second Programmes for Economic Expansion. From 1961 to 1970 the average annual population growth rate was 0.47%. After Ireland's accession to the EEC the expected continuation of rapid economic growth should prevent a further increase in net emigration. But a substantial reduction in net emigration only appears plausible with certain reservations since it is to be expected that, when access to the labour markets of certain continental countries in the EEC is made easier by institutional measures, this will provide an additional incentive for Irish workers to emigrate to the continent. On the basis of these considerations we estimate the annual population growth rate for 1970-77 as 0.50% - the rounded-off figure for the annual growth rate for 1961-70.

2. Hypotheses on retail prices

In formulating hypotheses on nominal retail prices for foodstuffs in Ireland in 1977, we used fundamentally the same methods as were applied for the formulation of retail price hypotheses in the survey on the United Kingdom. The nominal retail prices are broken down into two components, which are "forecast" separately:

- the raw material component, which is, in general, represented by the average market price or producer price obtained by the producer;

- the processing costs and trading margin, which arithmetically represents the difference between the retail price and the market price obtained by the producer. In addition to processing costs and wholesale and retail margins, it includes indirect taxes.

a. Hypotheses on producer prices

The producer prices we anticipate in Ireland after expiry of the transitional period for adjustment to the Community agricultural prices are shown in Table 4. Table 3 was taken as a basis for the producer price hypotheses shown in Table 4 for 1977/78. The former table gives the producer prices assumed for the enlarged Community in the 1977/78 farm year, related to existing EEC qualities or standards (an explanation of this table (in units of account) has already been given in the introduction). Consequently, all we need to do here is to describe the most important modifications appearing in Table 4 compared to Table 3:

- Cereals in general: Irish cereal prices are based on a moisture content of 20% and Community prices on one of 16%. To adjust Community prices to Irish prices, the basic intervention prices for wheat were multiplied by a factor of 0.89286 (barley and oats 0.83333)[1]. The producer prices for cereals in Ireland in 1977/78 - after allowing for a different moisture content (see above) - were taken as being equivalent to the Community's basic intervention prices for 1977/78 - in other words, it was assumed in principle that Irish prices are higher than the derived intervention prices by an amount that more or less corresponds to the difference between the derived intervention prices and the basic intervention price ($\approx$ reduction for transport costs).

- Barley for malting: No separate basic intervention price is fixed for this type of barley in the Community. The decisive factor determining the producer price of barley for malting in Ireland in 1977/78 should be the way in which the market values the difference in quality between barley for malting and fodder barley. It was assumed that the "margin" for barley for malting over fodder barley would drop from £0.78 per 100 kg (1967/69) to £0.37 per 100 kg in 1977/78, which amounts to no more than a slightly intensified continuation of the trend in the period under review.

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[1] This conversion is based on: Department of Agriculture and Fisheries, Irish Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970, p. 51 et seq.

Table 3 - Hypotheses on the prices [a] of important agricultural products in the enlarged EEC for the 1977/78 farm year

Product	Type of price	Unit	1972/73	1977/78	Percentage increase 1977/78 : 1972/73	Average annual percentage increase 1972/73 - 1977/78
Common wheat	-Basic intervention price	£/1000 kg	43.6	48.3	+ 10.8	+ 2.1
Barley	-Basic intervention price	£/1000 kg	39.9	44.6	+ 11.8	+ 2.3
Maize	-Intervention price (France)	£/1000 kg	(34.7)[c]	44.6	.	.
Oats	-Market price	£/1000 kg	(33.6)[l]	41.7	.	.
Sugar beet	-Minimum price[b]	£/1000 kg	7.4	7.9	+ 6.8	+ 1.3
White sugar	-Intervention price	£/1000 kg	97.3	1103.0	+ 5.9	+ 1.2
Ware potatoes	-Market price[d]	£/1000 kg	.	18.8	.	.
Rape, rapeseed	-Basic intervention price	£/1000 kg	84.4	92.9	+10.1	+ 1.9
Milk	-Target price ex-dairy (3.7% fat)	£/1000 kg	49.04	56.3	+14.8	+ 2.8
Butter	-Intervention price	£/1000 kg	775.0[e]	833.0	+ 7.5	+ 1.5
	-Threshold price	£/1000 kg	838.1[f]	917.0	+ 9.4	+ 1.8
Skimmed milk powder	-Intervention price	£/1000 kg	225.0	292.0	+29.8	+ 5.4
	-Threshold price	£/1000 kg	279.2[f]	350.0	+25.4	+ 4.6
Whole milk powder	-Threshold price (26% fat)	£/1000 kg	486.3[f]	545.0	+12.1	+ 2.3
Condensed milk, unsweetened	-Threshold price	£/1000 kg	206.0[f]	231.0	+12.1	+ 2.3
Condensed milk, sweetened	-Threshold price	£/1000 kg	275.4[f]	310.0	+12.6	+ 2.4
Cheddar cheese	-Threshold price	£/1000 kg	650.2[f]	743.0	+14.3	+ 2.7
Beef	-Guide price	£/1000 kg live weight	325.0[e]	394.0	+21.2	+ 3.9
Mutton and lamb	-"Guide price"	£/1000 kg live weight	295.8[g]	358.0[g]	+21.0	+ 3.9
Pigmeat	-Basic price	£/1000 kg slaughter weight	343.8	378.0	+ 9.9	+ 1.9
Poultrymeat	-Sluice-gate price[h]	£/1000 kg slaughter weight	0.2880[k]	0.3320	+15.3	+ 2.9
Eggs	-Sluice-gate price[j]	£/10 eggs	0.11276[k]	0.1310	+16.2	+ 3.0

[a]Prices given in £ on the basis of 1 unit of account = £0.416667 (valid until 23.6.1972 - i.e. until the floating of the British £). [b]For beet within the basic quota; area: Aisne, Somme, Oise (France). [c]August 1972. [d]Average producer price for maincrop ware potatoes in Germany. [e]Valid from 15.9.1972. [f]Threshold prices fixed for dairy products on 1.4.1972. [g]91% of the guide price for beef (for explanation c.f. text). [h]"70% chickens" (plucked and drawn, without heads and feet but with hearts, livers and gizzards). [i]Valid from 17.5.1972 - 31.7.1972. [j]Poultry eggs, in shell, fresh and preserved (Class A4 = 55-60 grammes per egg). [k]Valid from 1.8.1972 - 31.10.1972. [l]Market price in Germany in August 1972 (Hanover).

Source: Directorate-General for Agriculture, Directorate for Agricultural Economics and Structure, EEC Information: Agricultural markets, prices (livestock and crop products), Brussels, various issues. Own calculations and estimates.

Table 4 - Hypotheses on the producer prices of important agricultural products in Ireland for the 1977/78 farm year (£ per 100 kg)

Product	Average producer price 1967/69	Assumed average producer price 1977/78	Producer price 1977/78 as % of prices in 1967/69	Annual percentage increase or decrease ø 1967/69 to 1977/78
Common wheat[a]	3,22	4,30	133,5	+ 3,3
Fodder barley - support price[b]	2,26	3,70	163,7	+ 5,6
- market price[b]	2,24		165,2	+ 5,7
Barley for malting[c]	3,04	4,07	133,9	+ 3,3
Oats[d]	2,21	3,50	158,4	+ 5,2
Potatoes[e]	1,96	1,88	95,9	- 0,5
Sugar beet[f]	0,832	0,844	101,4	+ 0,2
Sugar[g]	6,65	9,30	139,8	+ 3,8
Beef[h]	17,61	43,30	245,9	+10,5
Mutton and lamb[i]	19,11	37,60	196,8	+ 7,8
Liquid milk[j]	3,010	6,000	199,3	+ 8,0
Manufacturing milk - I[k]	2,523	5,630	223,1	+ 9,3
- II[l]	2,380	5,300	222,7	+ 9,3
Butter[m]	4,491	83,30	185,5	+ 7,1
Cheese[n]	28,20	67,55	239,5	+10,2
Pigmeat[o]	26,58	37,80	142,2	+ 4,0
Eggs (£ per 120)[p]	1,69	1,57	92,9	- 0,8

[a] Calculated average price for all sales regardless of quality (basis: green, 20-21% moisture content). [b] With a moisture content of 20%. [c] Contract price arranged between producers' representatives and breweries (moisture content 20%). [d] Market price, probably on basis of 20% moisture content; support price for oats under the marketing programme for oats newly introduced in the western counties in 1968: £2.25 per 100 kg in 1968 and £2.36 (1969); moisture content 20%. [e] Market price for maincrop ware potatoes. [f] Basic price fixed by the Irish Sugar Company for sugar beet with a sugar content of 15.5% with inclusion of freight subsidy and equivalent value of the (unused) pulp quota; valid only for beet produced on the quota area. [g] Average market price obtained by the Irish Sugar Company for refined granulated sugar. [h] Auction price in Dublin for cattle (Hereford crosses); live weight. [i] Average market price for lambs and hoggets (fatstock) in Dublin; live weight. [j] Calculated average price for all sales; with natural fat content. [k] Estimated average price for manufacturing milk sales assuming that 100% of the skimmed milk is sold with it. [l] Calculated average price for all manufacturing milk sales, with only about 60% cream and 40% whole milk being sold. [m] Support price for creamery butter (creamery price). [n] Creamery price fixed for Cheddar cheese. [o] Market price (including Dublin market) for bacon pigs; slaughter weight. [p] Market price (excluding Dublin market) for hen eggs.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Department of Agriculture and Fisheries, Irish Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970. Pigs and Bacon Commission, Report of Proceedings and Statement of Accounts for the year ended....., Dublin, various issues. Own calculations and estimates.

- White sugar: The sugar price shown for 1967/69 is the (calculated) average net sales proceeds of the Irish Sugar Company per 100 kg refined sugar. The ex-works price (no continuous data available) is slightly higher. In order to bring the intervention price for white sugar in the Community into line with the Irish net sales proceeds, the Community price for 1977/78 was multiplied by a factor of 0.9.

- Beef: The Irish market price in 1967/69 refers to Hereford Crosses, i.e. best-quality fatstock bred by crossing a Hereford beef bull with dairy cows of home-bred stock. The Community guide price for beef is, however, based more on an average quality, whereby culled breeding stock (slaughter cows, etc.) are also included. In order to take this quality difference into account at least in an approximate fashion, the Community guide price for 1977/78 was multiplied by a factor of 1.1.

- Mutton: The Irish price applies to good-quality fat hoggets and fat lambs. For the same reasons as in the case of beef, a "quality correction factor" of 1.05 was applied.

- Manufacturing milk: This is complicated by the fact that normally Irish milk producers sell only cream to dairies. The additional sale of skimmed milk is only possible under a separate sales contract which can be concluded only if the farmer so wishes (farmers have the option of selling the skimmed milk proportion in order to ensure an adequate supply for fattening calves and pigs). The creamery milk price shown in the annual reports of the Irish Department of Agriculture is, therefore, a cream price. From Irish statistics average sales proceeds per 100 kg manufacturing milk can be calculated; this represents a combined price (about 60% cream sales and 40% whole milk sales - see Manufacturing milk II in Table 4). As neither of these prices is comparable with the Community target price, it was first necessary to estimate for Ireland a creamery milk price for 1967/69

assuming a 100% sale of skimmed milk and taking a skimmed milk price of £0.3015 per 100 kg[1] and a skimmed milk proportion of 85% (Manufacturing milk I; Table 4). According to this estimate, there would be a rise of 123% in the Irish milk price from 1967/69 to the 1977/78 farm year, which was then merely transferred to creamery milk price II (2.23 x 2.38 = 5.30).

b. Hypotheses on the trading and processing costs margins

The trading and processing costs margins were estimated by means of assumptions, based on logical considerations, on the ratio (average annual growth rate of the "margin"): (average annual growth rate of the level of consumer prices). The principles on which this method is based have already been comprehensively described and discussed in the United Kingdom survey; they can be applied by analogy to Ireland, so that it is unnecessary to describe them again here.

c. Hypotheses on nominal and real retail prices

The hypotheses on the nominal retail prices for 1977 resulting from the estimates for the two components "raw material costs" and "trading and processing costs margin" are shown in Table 5, together with the estimated results for those two components. To obtain real retail prices (i.e. the prices we used in the demand functions) from the nominal retail prices, it is merely necessary to divide the respective nominal retail price for 1977 by the consumer price index assumed for 1977. The real retail prices for 1977 determined in this way are shown in Table 6. They show that in Ireland beef, mutton (and, accordingly, ox and sheep's liver), liquid milk and cheese would become much more expensive in real terms. The real retail price for creamery butter would, it is true, rise by "only" 9% between 1968/70 and 1977 (the reason for this being that in the period under review the Irish butter price was already supported at a

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[1] See Department of Agriculture and Fisheries, op.cit., p. 35.

Table 5 - Hypothese of the nominal retail prices and their most important components of some products in Ireland in 1977
livestock and crop (p per kg)

Product	Price or price component	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970		1977
Potatoes	Producers' market proceeds	2.37	1,98	1.27	1.87	1.95	1.40	1.65	2.47	2.15	1,90	1.71	2.26	2.76		1.88
	Processing costs and trading margin; taxes	0.83	0.71	0.46	0.63	0.61	0.93	1.30	1.11	0.88	0.90	0.98	1.71	1.96		3.80
	Retail price	2.90	2.69	1.73	2.50	2.56	2.33	2.95	3.58	3.03	2.80	2.69	3.97	4.74		5.68
White sugar	Average sales proceeds of Irish Sugar Company (ex-refinery)	5.58	5.45	5.48	5.43	5.68	6.33	6.70	6.27	5.96	6.14	6.65	7.17			9.30
	"Margin"	1.31	1.44	1.41	1.46	1.90	1.37	2.03	2.69	3.00	2.82	2.62	2.09			5.34
	Retail price	6.89	6.89	6.89	6.89	7.58	7.70	8.73	8.96	8.96	8.96	9.27	9.26	9.37		14.64
Beef	Auction price to producer for steers ("Hereford crosses") (slaughter weight)	26.9	28.4	26.0	25.9	27.4	26.6	29.9	31.1	28.5	29.2	34.7	35.9	38.1		81.8
	"Margin"	11.7	12.8	14.6	14.4	14.0	15.6	19.7	26.8	29.5	27.3	29.3	34.7	40.7		118.4
	Retail price (for round steak)	38.6	41.2	40.6	40.3	41.4	42.4	49.6	57.9	58.0	56.5	64.0	70.6	78.8		200.2
Mutton	Producers' market proceeds (slaughterweight)	31.1	29.0	30.4	26.4	26.9	31.7	34.7	33.6	34.4	35.2	41.4	42.6			78.2
	"Margin"	5.5	7.2	5.3	9.5	9.9	5.7	6.8	12.5	11.1	9.8	8.7	12.6			34.0
	Retail price (for leg)	36.6	36.2	35.7	35.9	36.8	37.4	41.5	46.1	45.5	45.0	50.1	55.2	62.2		112.2
Liver	Retail price for ox and sheep's liver[a]	27.8	28.5	28.4	26.3	28.2	29.0	31.9	35.5	35.0	34.4	37.7	41.5	46.3		95.0
Pork	Market proceeds for pork pigs (slaughter weight)	22.12	23.18	22.10	22.42	22.64	22.34	23.30	23.20	24.51	25.86	26.75	27.14	27.93		37.80
	"Margin"	16.0	14.8	16.9	17.3	17.0	18.0	20.0	21.2	21.0	21.3	22.4	23.3	27.0		42.5
	Retail price (for shoulder)	38.1	38.0	39.0	39.7	39.6	40.3	43.3	44.4	45.5	47.2	49.2	50.4	54.9		80.3
Bacon	Market proceeds for bacon pigs (slaughterweight)	22.4	23.2	22.5	22.7	22.4	22.5	23.2	23.5	24.8	25.9	26.8	27.1	27.9		37.8
	"Margin"	20.5	20.8	22.4	22.2	22.1	22.5	23.8	25.4	24.0	24.6	25.0	28.8	32.0		48.2
	Retail price (product weight; Irish streaky)	42.9	44.0	44.9	44.9	44.5	45.0	47.0	48.9	48.8	50.5	52.8	55.9	59.9		86.0
Meat total	Retail price[b]	36.8	37.6	37.7	37.8	38.1	38.8	42.7	46.6	46.6	46.7	50.8	54.7	60.4		114.8
Fish	Retail price[c]	20.4	20.4	20.5	21.2	21.9	22.4	24.9	25.2	27.1	27.9	28.8	32.8	38.3		60.7
Whole liquid milk	Average producer proceeds	2.27	2.29	2.36	2.37	2.37	2.41	2.61	2.69	2.84	2.98	3.01	3.03			6.00
	"Margin"	1.80	1.85	1.87	1.90	2.01	2.15	2.26	2.34	2.50	2.56	2.73	2.98			5.77
	Retail price	4.07	4.14	4.23	4.27	4.38	4.56	4.87	5.03	5.34	5.54	5.74	6.01	6.39		11.77
Butter	Ex-creamery price fixed by Government for creamery butter	40.9	41.3	44.1	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9		83.3
	"Margin"	6.8	6.1	5.4	5.2	4.9	5.6	6.9	6.8	7.9	9.3	9.0	8.1	9.6		14.8
	Retail price (creamery butter)	47.7	47.4	49.5	50.1	49.8	50.5	51.8	51.7	52.8	54.2	53.9	53.0	54.5		98.1
Cheese	Ex-creamery price fixed by Government for cheese - natural Cheddar	24.3	24.3	25.6	26.9	26.9	26.9	26.9	28.2	28.2	28.2	28.2	28.2	28.2		67.6
	"Margin"	7.5	7.4	8.2	8.6	8.9	9.3	10.5	10.2	10.7	11.1	11.6	13.1	15.6		28.5
	Retail price (natural cheese)	31.8	31.7	33.8	35.5	35.8	36.2	37.4	38.4	38.9	39.3	39.8	41.3	43.8		96.1
Eggs	Producers' market proceeds for hen eggs (p per dozen)	15.8	14.6	14.1	14.2	15.4	15.8	15.0	16.3	15.0	15.0	17.9	17.9	17.9		15.7
	"Margin" (p per dozen)	5.0	5.9	5.8	6.6	4.5	7.4	5.4	6.0	6.3	5.7	4.6	3.5	4.0		8.0
	Retail price (p per dozen)	20.8	20.5	19.9	20.8	19.9	23.2	20.4	22.3	21.3	20.7	22.5	21.4	21.9		23.7

[a] Direct estimate based on the price hypotheses for beef and mutton [b] Arithmetical mean of all meat prices (including liver). [c] Direct estimate.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Department of Agriculture and Fisheries, Irish Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970. Own calculations and estimates.

level considerably above world market prices), but, in view of a fall of 24% between 1958/60 and 1968/70, this represents a complete break with real price trends in the past. A continuation of the downward real price trend - although appreciably less marked - is also to be expected in the period up to 1977 for sugar, pork, bacon and eggs.

3. Estimate of per capita consumption of foodstuffs in 1977 using the demand functions; discussion and revision of the results

a. General comments

The results of the estimate of per capita consumption using the demand functions, certain amendments to these estimated values and the results of the projection of the consumption of those products, for which no demand functions could be produced, are shown in Table 7. Where necessary, the results of the estimates will be briefly explained - this is applicable in particular to the revised estimates and all direct estimates without a demand function.

b. Wheat flour

The income-induced fall in wheat flour consumption is likely to continue in the future - regardless of the level of bread prices. From equation (2) a fall of 21% in the per capita consumption of wheat flour from 1968/70 to 1977 can be calculated.

c. Potatoes

The crucial factor in the estimate of potato consumption is the negative effect of income, against which there is only a small positive effect of price. The real price of ware potatoes rose in the period under review by 6% and would fall by 10% by 1977, but, in view of the fact that in absolute terms the direct price elasticity is only about

Table 6 – Hypotheses on the real retail prices of important foodstuffs in Ireland in 1977
(p/kg)

	∅1958/60	∅1968/70	1977	Percentage change from 1958/60–1968/70	Average annual percentage change 1958/60 – 1968/70	Percentage change from 1968/70 to 1977	Average annual percentage change 1968/70 – 1977
Potatoes (fresh ware potatoes)	2.06	2.18	1.97	+ 5.8	+ 0.6	- 9.6	- 1.3
Refined sugar (granulated)	5.90	5.40	5.09	- 8.5	- 0.9	- 5.7	- 0.7
Beef (round steak)	34.4	41.1	69.6	+ 19.5	+ 1.8	+ 69.3	+ 6.8
Mutton (leg)	31.0	32,3	39.0	+ 4.2	+ 0.4	+ 20.7	+ 2.4
Pork (shoulder)	32,9	29,8	27.9	- 9.4	- 1.0	- 6.4	- 0.8
Bacon (Irish streaky or streaky rashers)	37.7	32,6	29,9	- 13.5	- 1.4	- 8.3	- 1.1
Liver (ox and sheep's)	24.2	24.2	33,0	± 0	± 0	+ 36.4	+ 4.0
Meat – total [a]	32.0	32,0	39,9	± 0	± 0	+ 24.7	+ 2.8
Fish (whiting)	17,5	19,2	21,1	+ 9,7	+ 0.9	+ 10,0	+ 1.2
Liquid milk, whole (fresh)	3,55	3,50	4.09	- 1,4	- 0,1	+ 16,9	+ 2,0
Creamery butter	41.3	31.3	34.1	- 24.2	- 2.7	+ 8.9	+ 1,1
Cheese (natural)	27,8	24,1	33,4	- 13,3	- 1.4	+ 38,6	+ 4.2
Eggs (standard)	17,5	12,8	8,2	- 26.9	- 3,1	- 35,9	- 5.4

[a] Weighted average of the retail prices for beef, mutton and pork and for bacon and liver (weightings–0.2 respectively)

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Department of Agriculture and Fisheries, Irish Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970. Own calculations and estimates.

1/5th of the income elasticity, this could slow down only slightly the income-induced contraction in the demand for potatoes). On balance a fall of 8.9% in the per capita consunption between 1968/70 and 1977 is obtained (1958/60 to 1968/70: - 11.5%).

d. Sugar

If the consumption of household sugar is forecast by means of equation (4), we obtain, despite a slight reduction in the real price, a 17% fall in per capita consumption by 1977, since the negative income effect is predominant (ratio of income elasticity to direct price elasticity in absolute terms : 1.9). The strongly negative income elasticity of household sugar, which is due largely to the substitution of industrial sugar for household sugar, implies a high positive income elasticity for industrial sugar. Accordingly, an increase of 40% in the per capita consumption of industrial sugar from 1968/69 to 1977 was estimated by means of equation (5). We also obtained an increase of 11%, to 57.4 kg, in total per capita sugar consumption by 1977.

e. Meat and meat products

In an estimate of the consumption of beef using equation (6), the strongly positive income and cross-price effect (mutton) is almost entirely cancelled out by the very high negative own price effect (price increase of almost 70% from 1968/70 to 1977 for beef and a direct price elasticity of - 0.6) so that there remains only an increase of 3.3% in per capita consumption by 1977. But even this result appears too optimistic. The direct price elasticity of - 0.6 was estimated for a period in which the price of beef rose in real terms by "only" 20%. With a rise of 70%, it may be advisable to up somewhat the absolute value of the direct price elasticity or to propose for 1977 a correspondingly lower per capita consumption of beef (17.0 kg, a reduction of 7.6% compared with 1968/70).

Unlike beef, the demand for mutton and lamb in the period under review was extremely sensitive to price changes. This factor, together

Diagram 1 - Per capita consumption of sugar in general and of household and industrial sugar, real retail prices of refined sugar and real private consumer expenditure per head of population in Ireland 1958-70 and forecasts for 1977

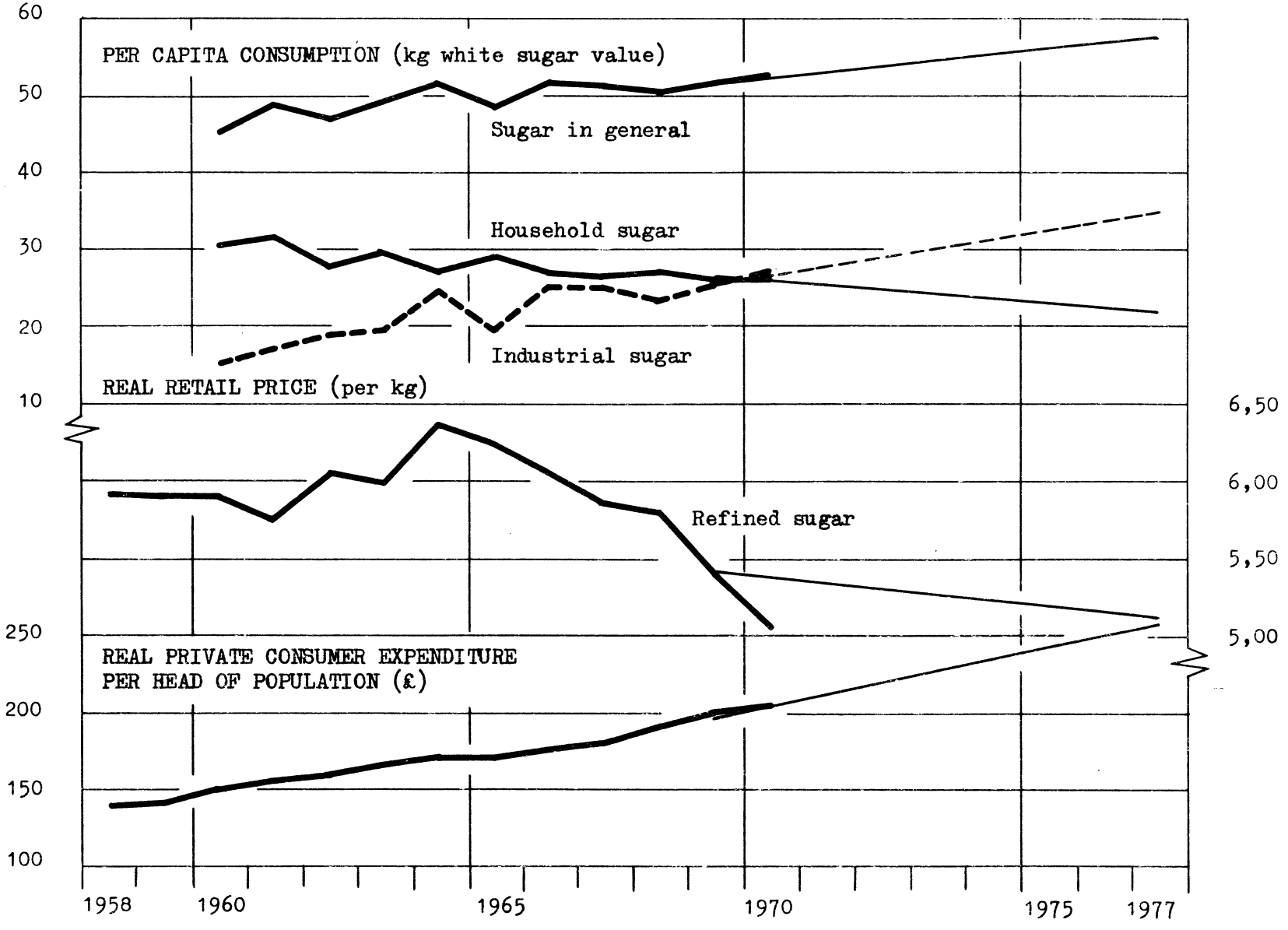


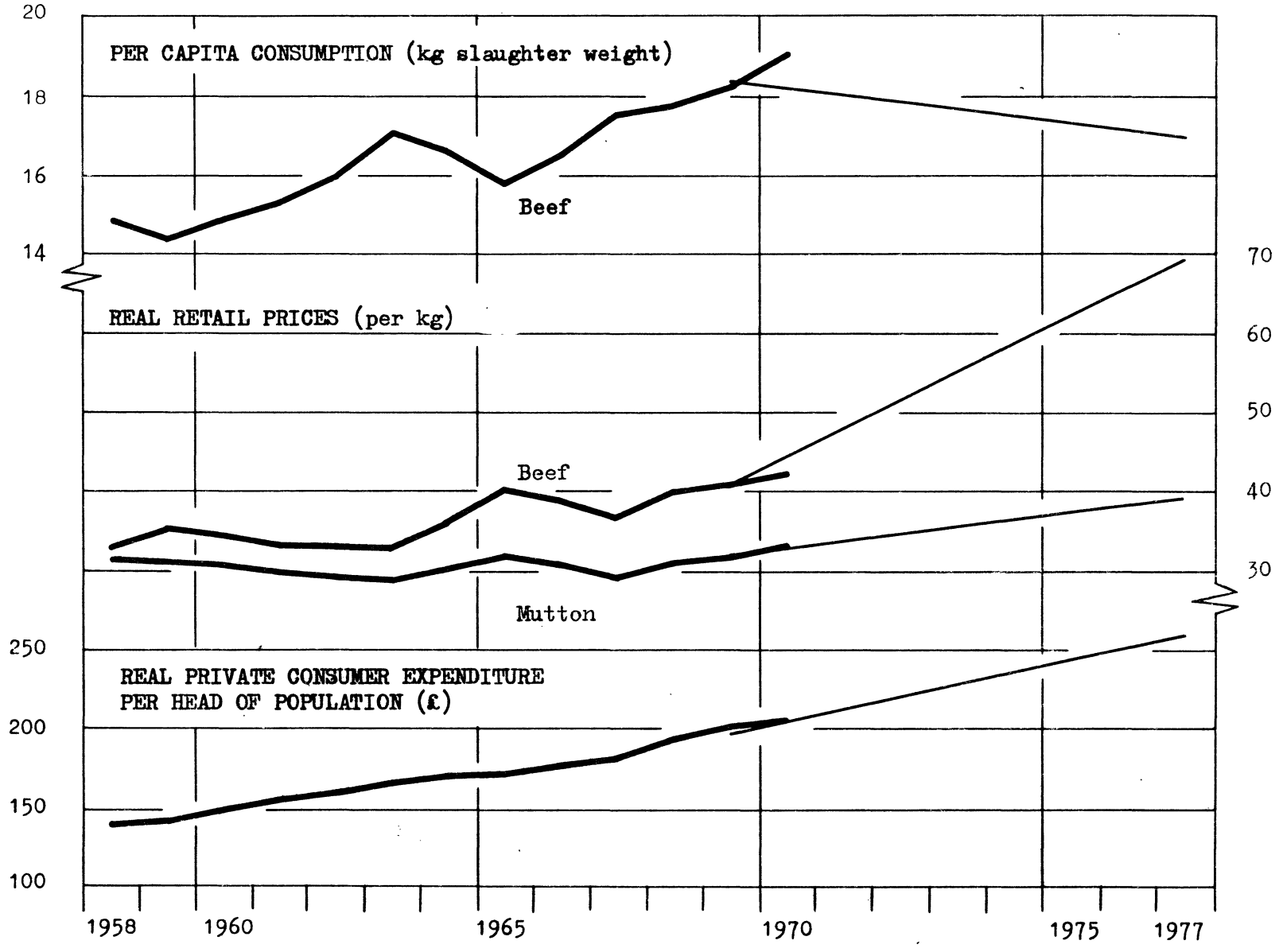
Table 7 - Results of the forecast of the per capita consumption of important foodstuffs in Ireland using the demand functions and revised estimates for 1977
(kg)

Product	ø1958/60	ø 1968/70	Forecasts for 1977			Direct estimate without demand function
			Estimate from demand function	No. of equation used	Revised or selected value	
Wheat flour	94.1	77.1	61.0	(2)	-	-
Potatoes	157.5	139.4	127.0	(3)	-	-
Sugar - direct consumption	30.2[a]	26.5	22.1	(4)	-	-
Sugar - indirect consumption	15.3[a]	25.3	35.3	(5)	-	-
Beef	14.7	18.4	19.0	(6)	17.0	-
Mutton	10.0	10.9	10.4	(7)	-	-
Pork	5.2[c]	6.5	7.7	(8)	8.0	-
			7.9	(9)		
Bacon	16.2[c]	21.0	25.1	(10)	26.4	-
			26.4	(11)		
Poultrymeat	4.9	10.0	13.9	(12)	-	-
Edible offals[d]	8.5	11.8	11.8	(13)	-	-
Meat - total	59.3	78.6	91.6	(14)	87.5	-
Whole liquid milk	205.5	212.9	-	-	-	205.0
Whole milk powder (product weight)	0.35[a]	1.15	-	-	-	2.50
Cream (whole milk equivalent)	3.88[a]	5.67	7.20	(15)	6.00	-
Creamery butter	12.5	11.9	11.1	(17)	10.0	-
Farm butter	4.1	0.7	0	(18)	-	-
Butter, total	(16.6)	(12.6)	-	-	(10.0)	-
Margarine	2.9	4.0	-	-	-	5.0[e]
Butter and margarine	19.5	16.6	-	-	-	15.0
Cheese	1.1	2.2	3.1	(19)	2.5	-
Chocolate crumb (product weight)	1.24	4.29	7.70	(16)	6.00	-
Shell eggs (numbers)	287	223	172	(20)	-	-
Egg products (numbers)	16	24	25	(21)	-	-
Apples	11.6	15.6[b]	-	-	-	18.0
Tomatoes	5.2[a]	6.1[b]	-	-	-	6.5

[a]1960. [b]1968/69. [c]1959/60. [d]Liver, heart, kidneys, etc. [e]Determined as residual value.

Source: See respective supply situation statements. Own calculations and estimates.

Diagram 2 - Per capita consumption of beef, real retail prices of beef and mutton, and real private consumer expenditure per head of population in Ireland 1958-70 and forecasts for 1977



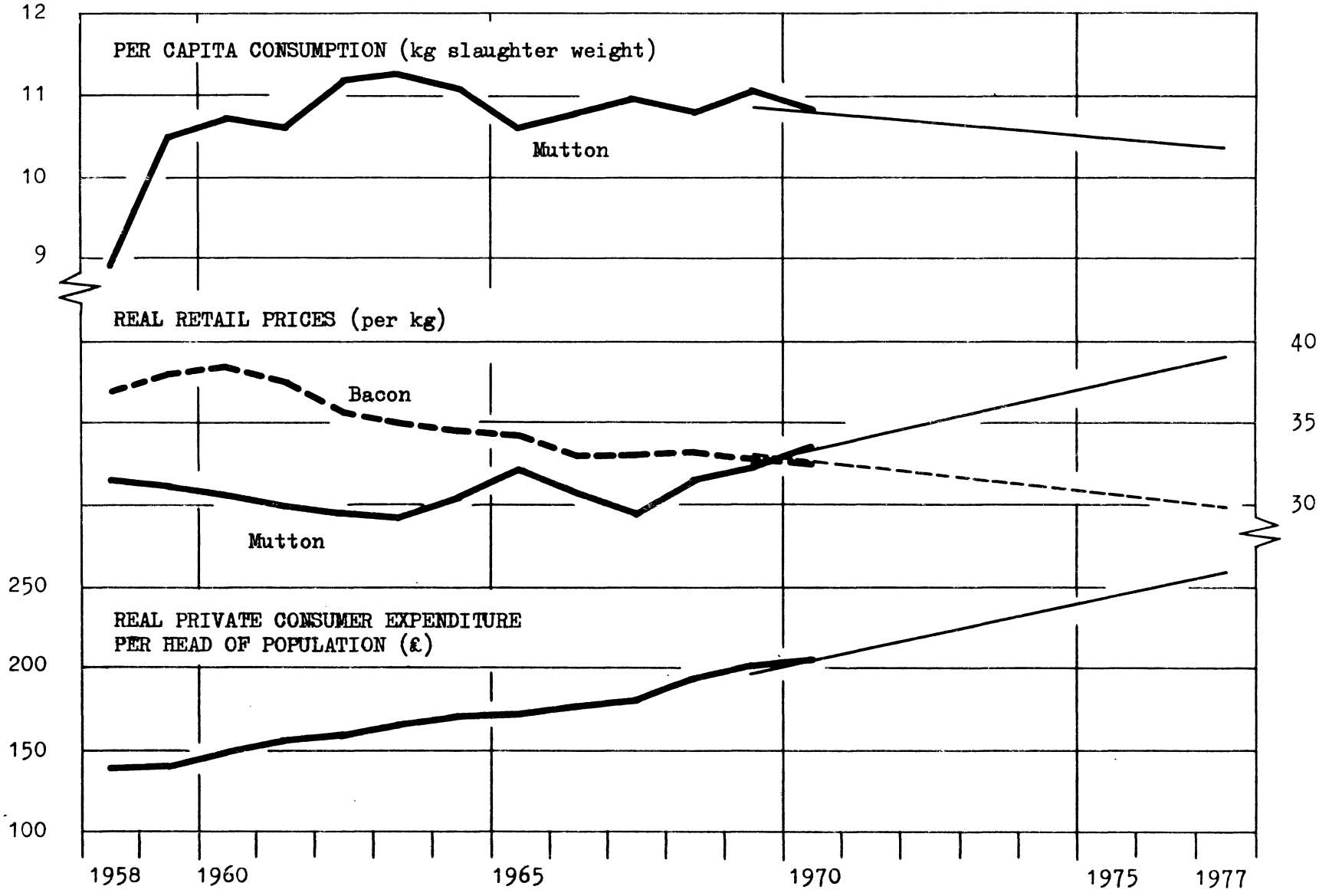
with the likelihood that under Community conditions the price of mutton in real terms will not rise nearly as exorbitantly as that of beef, lead us to leave unchanged the elasticity coefficients characterising equation (7). The expected rise of 20% in the price of mutton will be extremely significant as a result of a direct price elasticity of - 0.9. As the cross-price effect (bacon) is also negative, the positive income effect is clearly overcompensated (reduction of 4.6% in the consumption of mutton and lamb from 1968/70 to 1977).

In view of the extremely high direct price elasticity - in absolute terms - of the demand for pork, calculated both from equation (8) (2.6) and from equation (9) (2.5) and given our hypothesis of a real price for pork which is 6.4% lower in 1977 than in 1968/70, we obtain despire the negative income effect a per capita pork consumption that will rise sharply (in equation (9), in addition to the positive own price effect, there is also a positive cross-price effect as regards mutton). Regardless of any shortcomings that equations (8) and (9) may have for the period under review, we consider this result plausible at least as far as the trend is concerned, since the relatively greater increase in the prices of beef and mutton compared with pork will probably give additional impetus to the change in consumer habits in favour of fresh pork, especially in rural areas (see p. 7). If the per capita consumption of 7.9 kg estimated with equation (9) is rounded off to 8.0 kg, we obtain a 23.9% increase in consumption from 1968/70 to 1977.

For similar reasons as those given for pork, we have chosen, in the case of bacon, from the two "competing" estimates the one which gives the higher per capita consumption of bacon for 1977 (26.4 kg from equation (11); increase 1968/70 - 1977 : 25.7%). An important substitute for bacon is mutton, which, according to our expectations, will become much more expensive compared with bacon. In addition to the resulting positive cross-price effect, the own price and income effects too are clearly positive in (11).

If the demand for poultrymeat is forecast by means of equation (12), account must be taken of the fact that the very high income elasticity

Diagram 3 - Per capita consumption of mutton, real retail prices of mutton and bacon, and real private consumer expenditure per head of population in Ireland 1958-70 and forecasts for 1977

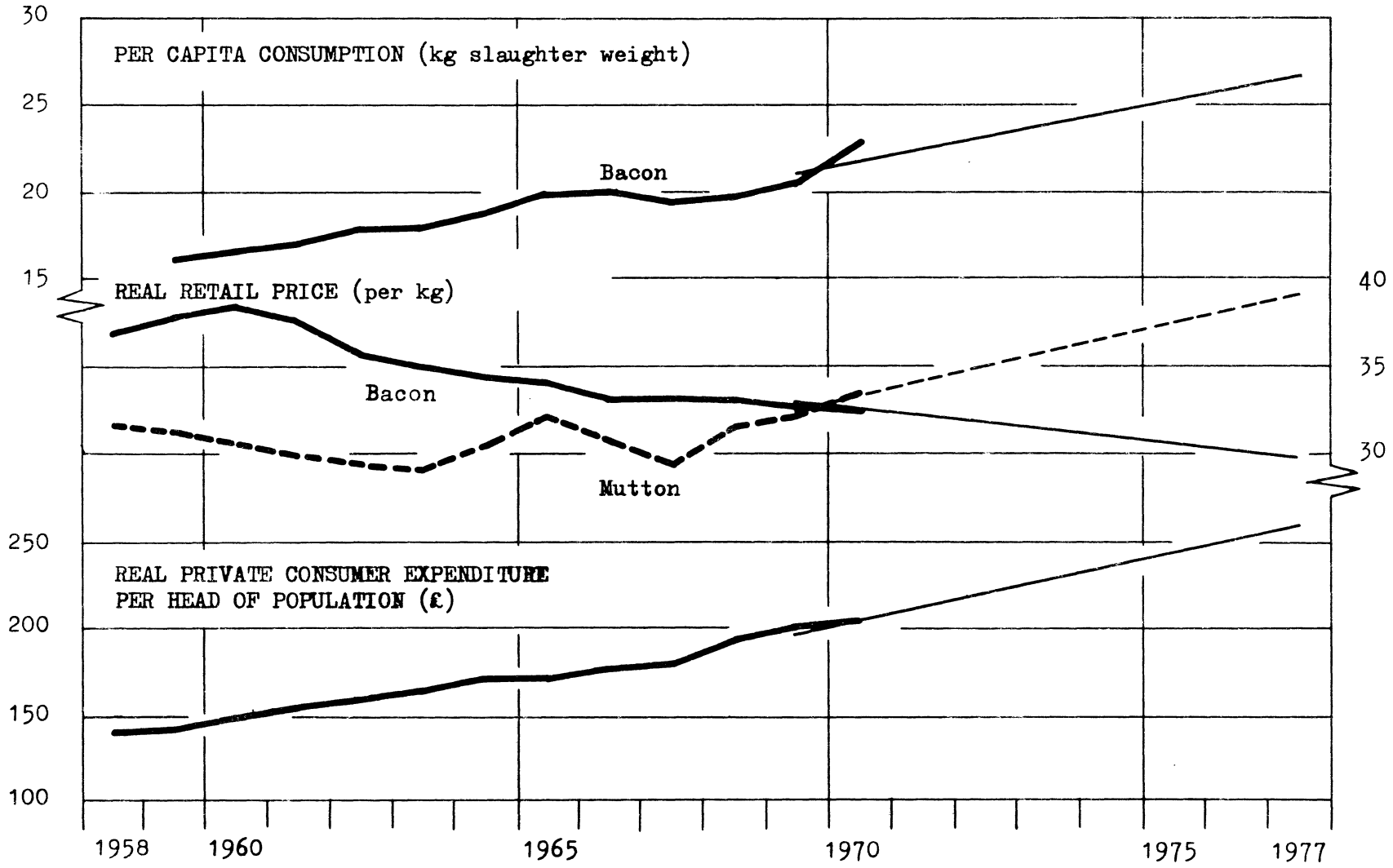


of 2.2 probably contains a (strongly positive) price effect. According to the information available to us, it can be assumed that the retail price for broilers, which account for the bulk of the supply of poultry, will develop similarly to the price of eggs under Community conditions. According to our price hypotheses, the real price for eggs would fall by more than 30% from 1968/70 to 1977. Under these circumstances, the assumption that a high negative correlation between real income and the real retail price of poultry will continue until 1977 ought to be justified. This in turn justifies a forecast of poultrymeat consumption by means of (12) without changing the regressing coefficient of log C_{pr}.

Equation (13) gives an unchanged per capita consumption of edible offals in 1977 compared with 1968/70, since the positive income effect is offset by the strongly negative own price effect (direct price elasticity - 0.7, real price for liver: + 36% in 1977).

If the estimates of the per capita consumption of the individual types of meat are added together, the consumption level obtained for meat in general is 87.5 kg in 1977 (increase of 11.3% over 1968/70). To check this value, the per capita meat consumption was also forecast by means of equation (14), and this gave a slightly higher value of 91.6 kg (increase of 16.5% in 1977 over 1968/70). The reason for this is the low negative own price effect resulting from the low sensitivity of total meat demand to price changes (direct price elasticity: - 0.22), which is substantially overcompensated by the strongly positive income effect and the similarly positive cross-price effect (with regard to fish). In the period under review the meat price remained constant in real terms; up to 1977 there will, according to our hypotheses, be a sharp increase of 25%. It may be assumed that consumers will react rather more strongly to a real price increase of this order of magnitude than is indicated in equation (14) for the period under review. If the regression coefficient of the meat price in (14) is changed in a similar fashion (e.g. so that there is a direct price elasticity of - 0.25 or - 0.30), then even with (14) a per capita consumption of less than 90 kg in 1977 would be forecast. We do not, therefore, feel it necessary to revise the estimated value (see above) obtained by means of the additive method on the basis of the estimate obtained by using (14).

Diagram 4 - Per capita consumption of bacon, real retail prices of bacon and mutton, and real private consumer expenditure per head of population in Ireland 1958-70 and forecasts for 1977



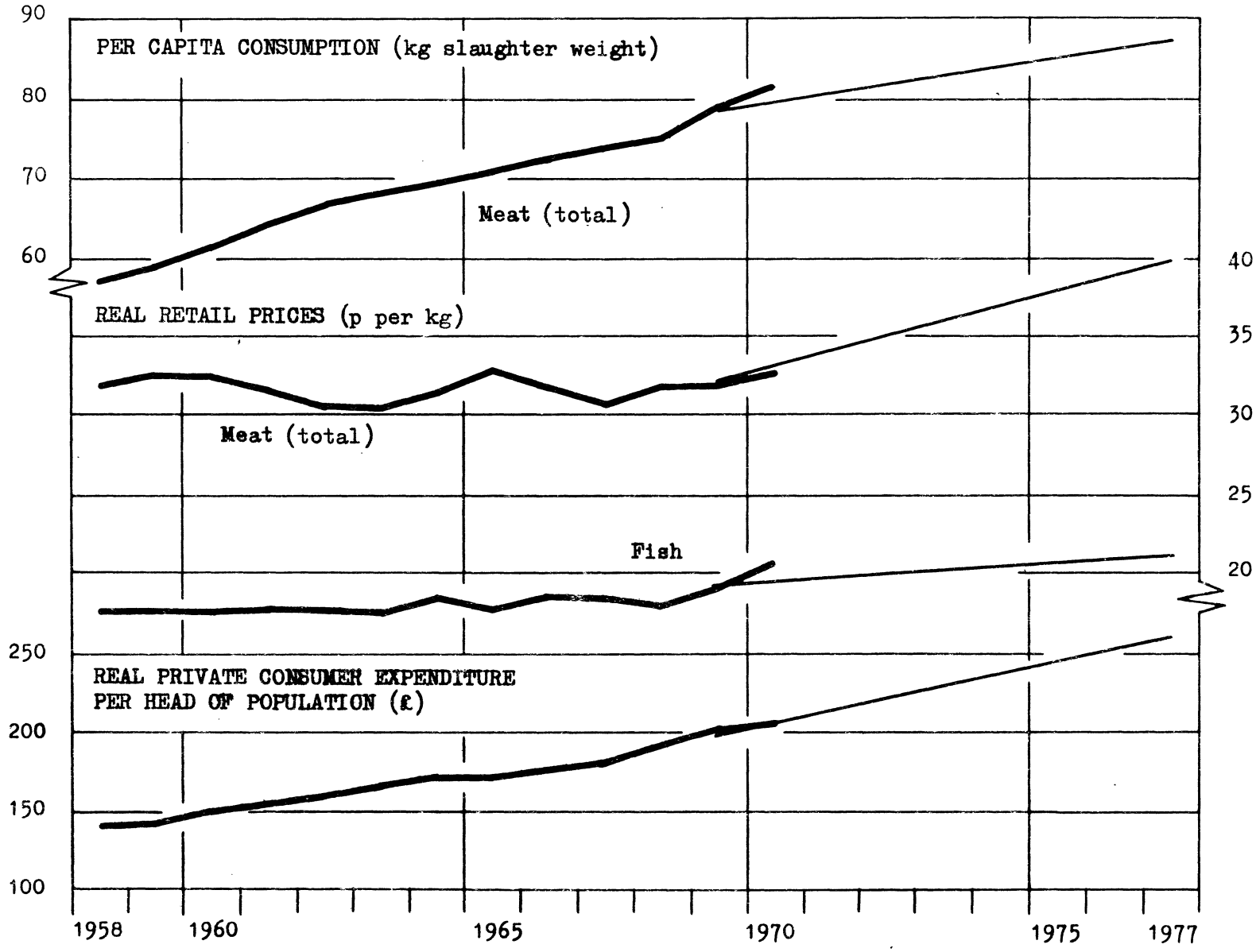
f. Milk and milk products

Per capita consumption of liquid milk in the first half of the period under review tended to increase (1960: 210.1 kg; 1965: 216.5 kg), but then it declined again to 212.6 kg in 1970. This trend cannot be accounted for by either income or the price of milk. It is striking, however, that the consumption of whole milk powder remained practically constant during the time that liquid milk consumption was expanding (1960/61 and 1964/65: 2.8 kg whole milk equivalent) and increased sharply while liquid milk consumption was declining (1968/70: 9.2 kg whole milk equivalent). If liquid milk and whole milk powder are taken together, there is a steady upward trend (1960/62: 215.8 kg, 1964/66: 219.5 kg, 1968/70: 222.7 kg). We assume that this can be attributed to the substitution of whole milk powder for liquid milk as a baby food (prepared baby food based on dried whole milk and other things) which only occurred to any great extent in the years after 1965[1] and that, generally speaking, this trend will continue unchanged in the coming years. Using a graphical trend extrapolation, a total per capita consumption for liquid milk and whole milk powder of 225.0 kg in 1977 was forecast; of this liquid milk could account for 205.0 kg and dried whole milk 20.0 kg.

In estimating per capita cream consumption by means of equation (15), it must be borne in mind that in (15) the effect of the cream price could not be explicity included for want of data concerning its price. To judge by the trend in the real prices of liquid milk and butter in the period under review, the real price of fresh cream should in the same period have tended to decline so that the income elasticity of + 1.2 resulting from (15) probably also contains a significantly positive price effect

[1] The bulk of the total consumption of whole milk powder is accounted for by baby foods; in recent years only about 30 - 40% of the total quantity of whole milk powder available in the country has been used in the chocolate and confectionery industry.

Diagram 5 - Per capita consumption of meat (total), real retail prices of meat (total) and fish, and real private consumer expenditure per head of population in Ireland 1958-70 and forecasts for 1977



too. Under Community conditions, however, a considerable rise in the real price of fresh cream would be expected according to the price hypotheses for liquid milk and butter. This means that with (15) the per capita cream consumption in 1977 would be overestimated. For this reason, the estimate calculated from (15) has been corrected downwards (6.00 kg whole milk equivalent, increase of 6% 1968/70 to 1977).

In 1960–69 the average income elasticity of the demand for chocolate crumb was surprisingly high at 4.2; it was two and a half times greater than that for industrial sugar. The main reason for this must have been a sharp increase in the proportion of products containing chocolate crumb in the total consumption of confectionery, chocolate and other sweet products (in actual fact, in the total production of confectionery, chocolate, etc., since domestic consumption of chocolate crumb also includes goods later exported in the form of products containing chocolate crumb; however, we have no information on the exports of such products). Any further rise in this proportion is likely, however, to be fairly limited. In view of this, we thought it advisable to limit the possible increase in chocolate crumb consumption in the future to the growth in industrial sugar consumption (per capita). This made it necessary to reduce the estimate of 7.7 kg product weight obtained for 1977 to 6.0 kg (+ 40% as against 1968/69).

Per capita consumption of <u>creamery butter</u> was first estimated by equation (17), which gave a marginal decline of 0.8 kg to 11.1 kg in per capita butter consumption from 1968/70 to 1977 (slightly negative income and price effect). The price ratio (butter : margarine), which fell by a good 10% in the period under review, could increase by 20% by 1977 under Community conditions. There is much to indicate that Irish consumers will react more sharply to this than in the years 1958–70 (direct price elasticity: - 0.2). Accordingly, the highest estimate was corrected downwards (assumption: 10.0 kg in 1977; reduction since 1968/70: 16%).

Equation (18) gave a negative value for per capita farm butter consumption in 1977, and we take this to mean that the demand for farm butter in 1977 will be almost insignificant, in that its small volume can be disregarded.

Per capita consumption of butter and margarine taken together showed a marked downward trend in the period under review (1958/60: 19.5 kg; 1968/70: 16.6 kg; fall: 14.1%). By means of a graphical trend extrapolation, a value of 15.0 kg was estimated for 1977. It may be assumed that - as in most other Western European countries - this is due primarily to a reduction in fat consumption on health grounds. If the estimated per capita creamery butter consumption is deducted from the per capita butter and margarine consumption suggested for 1977, we obtain a per capita consumption of margarine in 1977 of 5.0 kg (25% increase as against 1968/70).

For the period under review, the price of cheese was not seen to have had any significant influence on demand. From 1958/60 to 1968/70 the real retail price of cheese dropped by 13%; according to our hypotheses, there will be a rise of almost 40% by 1977. This complete break with the real price trend is extremely likely to slow down the future growth in the consumption of cheese. Consequently, we have greatly reduced the estimate of 3.1 kg obtained from equation (19), assuming a figure of 2.5 kg (14% increase from 1968/70 to 1977).

g. Eggs and egg products

With equation (20)a decline in the per capita consumption of fresh eggs was estimated for the period from 1968/70 to 1977. The decisive factor here is the strongly negative income effect, which is only insignificantly reduced by the positive effect of the bacon price, since, on the one hand, the expected fall in the real price of

bacon by 1977 is only small and since, on the other, the demand for fresh eggs reacts only slightly to changes in the price of bacon as a complementary product (elasticity: - 0.15). This in turn can be accounted for by the fact that the proportion of eggs consumed with bacon in total fresh egg consumption is not particularly high. The reduction in per capita fresh egg consumption would, according to our estimates (equation (21)), be offset by an increase in per capita consumption of egg products of only 4% by 1977. Converted to shell egg equivalent, we obtain on balance a total decrease of 50 eggs or 20% in per capita consumption of eggs between 1968/70 and 1977.

h. Apples and tomatoes

For apples and tomatoes retail prices are more likely to fall in real terms under Community conditions. In addition, it is to be expected that qualitatively the supply will improve considerably (dessert and cooking apples) and that the abolition of seasonal quotas for tomato imports will guarantee a greater supply of tomatoes on the market in the months concerned (from May to mid-October, when domestic tomatoes have to compete with imported tomatoes). This leads us to assume that the rising trend in the consumption of apples and tomatoes already noticeable in the period under review will continue until 1977.

4. Summary of the results of the demand projections

The results of the demand projections for 1977 are summarized in Table 8. The products of particular interest are those where the demand forecast reflects mainly the effects of Ireland's adoption of EEC agricultural prices. In this way it is possible to differentiate between direct and indirect high and low price effects according to whether in real terms the product in question is expected to become much dearer or much cheaper on the basis of our

Table 8 - Results of the forecast of the total consumption of the important foodstuffs in Ireland in 1977

Product	ø1958/60	ø1968/70	1977	Percentage increase or decrease 1968/70 to 1977	Annual Percentage increase or decrease ø1968/70 to 1977
Wheat flour (product wt).....	268	225	186	- 17.3	- 2.3
Potatoes.....	448	408	387	- 5.1	- 0.6
Sugar - total (white value)...	133	152	175	+ 15.1	+ 1.8
Direct consumption (white value)	84	78	67	- 14.1	- 1.9
Indirect consumption (white value)	49	74	108	+ 45.9	+ 4.8
Meat-total (slaughter weight)	169	231	266	+ 15.2	+ 1.8
Beef (slaughter weight)	42	54	52	- 3.7	- 0.5
Mutton (slaughter weight)	29	32	32	+ 0	+ 0
Pork (slaughter weight)	15[b]	19	24	+ 26.3	+ 3.0
Bacon (slaughter weight)	46	62	80	+ 29.0	+ 3.3
Poultrymeat (slaughter weight)	14	29	42	+ 44.8	+ 4.7
Edible Offals (slaughter weight)	24	35	36	+ 2.9	+ 0.4
Whole liquid milk.....	584	623	624	+ 0.2	+ 0.0
Whole milk powder (product wt).	1.0[c]	3.7	7.6	+ 105.4	+ 9.4
Cream (whole milk equivalent).	11[c]	17	18	+ 5.9	+ 0.7
Chocolate crumb (product wt)..	3.5[c]	12.5[a]	18,0	+ 44.0	+ 4.7
Butter-total (fresh weight)...	47	37	31	- 16.2	- 2.2
Margarine.....	8	12	15	+ 25.0	+ 2.8
Butter and margarine.....	55	49	46	- 6.1	- 0.8
Cheese.....	3.3	6,5	7.6	+ 16.9	+ 2.0
Eggs total (mill. dozens).....	72.0	60.2	50.0	- 16.9	- 2.3
Direct consumption (mill.d)	68.1	54.4	43.7	- 19.7	- 2.7
Indirect consumption (mill.d)	3.9	5,8	6,3	+ 8.6	+ 1.0
Apples.....	33	45[a]	55	+ 22.2	+ 2.5
Tomatoes (only fresh tomatoes)	15[c]	18[a]	20	+ 11.1	+ 1.3

[a] ø 1968/69. [b] ø 1959/60. [c] 1960.

Source: Supply situation statements. Own calculations and estimates.

hypotheses after Irish prices have been adjusted to EEC prices and according to whether these real price changes have had a direct effect (through the direct price elasticity of demand) or an indirect effect (through the cross-price elasticity of demand) on the forecast of demand for that product. Important direct high price effects (contracting influence on demand) are to be found mainly in the forecasts of the consumption of beef and mutton, edible offals, cream, butter (creamery product) and cheese. High price effects (expansive influence on demand) are also to be found in respect of important substitutes for the products listed above (pork, bacon, poultrymeat, margarine). One spectacular example: the forecast decrease (2.3% from 1968/70 to 1977) in the consumption of beef and mutton, the real prices of which will rise considerably under EEC conditions which could be accompanied by a marked increase (32.7% from 1968/70 to 1977) in the consumption of pork, bacon and poultrymeat, i.e. types of meat which are becoming considerably cheaper than beef and mutton. Noticeable direct low price effects played an important role in the forecast of demand for fruit and vegetables (apples, pears and tomatoes) (1968/70 to 1977 a rise in total consumption of apples, pears and tomatoes of 19% has been forecast).

5. Comments on the problem of the nutrition test

A nutrition test can provide sensible results only if the consumption of foodstuffs can be recorded almost comprehensively at least. However, in the case of Ireland this pre-condition is not met for specific reasons. The annual survey on the per capita consumption of foodstuffs published in December in the Irish Statistical Bulletin covers only the most important types of meat, liquid milk, butter, margarine, cheese, eggs and some basic foodstuffs of vegetable origin (bread, potatoes, sugar). There are no official figures for important headings such as fish, fruit and vegetables, edible oils, lard, manufactured edible fats, rolled oats and corn flakes. The OECD does, it is true, provide some estimates for the latter products, which clearly are mostly based on special

information provided by the Irish Central Statistics Office. Only in exceptional cases could the data worked out by ourselves on the basis of the official Irish statistics and relating to the per capita consumption of the products covered by this study be compared with the corresponding OECD data so that it was not possible to use directly the latter (for the products which we have not dealt with) together with the figures we had worked out for the other products. Under these circumstances, it does not seem appropriate to carry out the nutrition test.

III. Analysis of the supply of agricultural products

1. Construction of the equations for determining the areas under cultivation and animal numbers, and the results of the statistical examination of these equations

a. Cereals

The area under wheat in Ireland contracted considerably on a long-term basis during the period under review (1958/60: 144 000 hectares; 1969/71: 89 000 ha; contraction: 38%). The main reason for this was the adjustment under wheat market regulations of the domestic supply of millable wheat to domestic market capacity. Because of the falling consumption of wheat flour the total wheat-milling quotas allocated to the milling industry were also reduced. The same applies - after deduction of the demand for quality wheat which can only be met by imports - to domestic common wheat for flour production. Surpluses of millable wheat and of all unmillable wheat had to be sold to the milling industry at much lower prices as fodder. The steeply rising yields of wheat per unit area in the period under review, combined with the reduction in the milling quota, resulted chiefly in the above contraction in wheat cultivation, which should be taken into account in the equation for determining the area under wheat by introducing a time variable. The substantial deviations from the long-term trend could have been caused by both the changes in the price ratio (wheat : fodder barley) and the weather conditions obtaining when the wheat was sown. Wheat growing in Ireland consists almost entirely of spring wheat, which is sown in March. To test whether the weather has any influence on the area under wheat, a special dummy variable was constructed which relates the rainfall (in mm) to the temperature at sea level (degree Centigrade) in March (average figures recorded by measuring stations in all parts of Ireland). This "evaporation coefficient" should have a negative correlation with the area under wheat since excessive soil humidity can adversely effect the sowing of wheat.

The statistical check using the least squares method showed that the area under wheat can be explained satisfactorily by reference to the price ratio (wheat : fodder barley) logged by a given period and to a time trend; no significant effect of the weather could be detected:

Period: 1955-69

$$(22)\quad \log A(w) = +\,2.1155 + \underset{(1.7)}{0.98475} \log \left(\frac{P(w)}{P(b)} - 1\right) - \underset{(5.8)}{0.02869}\, T$$

$$R^2 : 0.740 \qquad D.W. : 0.93 \qquad \frac{\hat{\sigma}}{\log A(w)} = 4.1\%$$

where:

A(w) = area under wheat in June ('000 ha)

P(w) = calculated average producer price for wheat of all qualities (£ per 100 kg)

P(b) = market price (excluding Dublin) for fodder barley (£ per 100 kg)

According to (22), if the price ratio (wheat : barley) were increased by 1%, the area under wheat would, other things being equal, also increase by just 1%.

Both the area under cultivation and the prices for barley for malting are determined by contract; they are fixed annually in negotiations between maltsters, breweries and distilleries and producers' representatives. Under these conditions, it would hardly be useful to account for the areas under barley for malting by reference to prices or price ratios.

The area under fodder barley was probably influenced in the past by a number of factors. The competitive relationship vis-à-vis wheat cultivation shall be represented by the price ratio

(wheat : fodder barley). By far the largest proportion of the fodder barley harvest is used to feed pigs. As will be shown later, pig-keeping is dependent primarily on the price ratio (bacon pigs : barley meal). It is conceivable that those farmers in particular who mainly feed their own farm-grown barley to pigs determine their barley cultivation at least partly in accordance with the number of pigs they plan to keep. To take account of this, the price ratio (bacon pigs : barley meal) is introduced into the equation for determining the cultivation of fodder barley. In many parts of Ireland - including Munster - account must be taken of the possibility that dairy farming competes with the cultivation of fodder barley through the production factor pastureland so that even the milk price (including the subsidies for increasing the number of cows) could influence the size of the area under fodder barley. The continuing positive effect of the support price system for fodder barley on the cultivation of this type of cereal and the regulation of the wheat market (quotas), which favours barley are both factors whose influence can only be approximately accounted for by a time variable (for the regression coefficient of the time variable we expect, therefore, a positive sign). We shall not construct a special weather dummy variable for fodder barley since it can hardly be assumed that barley, which is far less sensitive to weather conditions than wheat, will show a perceptible reaction to weather conditions at the time of sowing when wheat did not.

With the exception of the price ratio (bacon pigs : barley meal), all the above factors go a long way towards accounting for the area under fodder barley:

Period: 1956-70

$$(23)\quad \log A(b) = +\,2.0991 \underset{(2.6)}{-\,1.2555 \log \left(\frac{1}{2}\sum_{j=1}^{2} P(m)_{-j}\right)} \underset{(1.2)}{-\,0.41369 \log \left(\frac{P(w)}{P(b)}\right)_{-1}}$$

$$\underset{(0.4)}{-\,0.01623\, D(c)_{-1}} \underset{(6.7)}{+\,0.04406\, T}$$

R^2 : 0.921 D.W. : 1.84 $\frac{\hat{\sigma}}{\log A(b)} = 2.2\%$

where:

A(b) = Area under fodder barley in June ('000 ha)

P(m) = Calculated average price of manufacturing milk (£ per 100 kg)

D(c) = Dummy variable for the calved heifer subsidy scheme or the beef cattle incentive scheme (1953-63 : 0; 1964 : 1.0; 1965-68 : directly proportioned to the number of heifers recorded each year (1969 : 0.3); 1970 : 0.5 (start of the beef cattle incentive scheme)).

The elastic reaction of fodder barley cultivation to changes in the price of manufacturing milk in (23) is worth mentioning: an increase in the manufacturing milk price by say 1% would, other things being equal, result in a reduction of 1.3% in the area under fodder barley. However, the (short-term) elasticity of the area under fodder barley in relation to the price ratio (wheat : fodder barley) is, at - 0.4, fairly low. It should, nevertheless, be noted that the long-term interactions between wheat and barley resulting primarily from the regulation of the wheat market (milling quota) are contained in the (significantly positive) regression coefficient of the time variable.

The area under <u>oats</u> was accounted for soley by means of a time trend and not by prices and price ratios. The factors responsible for the rapid decrease in the area under oats in the years after the Second World War are its long ripening period, especially when compared with barley, the low yields per unit area, the high proportion of fibre (disadvantageous for the compound feedingstuffs industry) and the decline in the number of horses. Even the introduction of a support price system for oats in the western counties of Ireland in 1968 could not check the contraction of the area under oats.

b. <u>Sugar beet</u>

Determination of the total area under sugar beet in the period under review was in the final analysis a matter for the Irish Sugar Company, which allocated a specific quota to any farmer who wished

to grow sugar beet. Consequently, there is no point in trying to account for the area under sugar beet by reference to the price of beet, for example. Another reason why there is no need to construct an equation for determining the area under sugar beet is that in the accession negotiations with the Community Ireland was granted a quota of 150 000 tons of white sugar which can be produced from domestic beet. The obvious course then is first to make assumptions, on the basis of previous trends, as to the possible level of the best harvest and the sugar yield from the beet in 1977. The sugar yield per ha in 177 is obtained by multiplying the sugar yield by the beet harvest. If the predetermined sugar production is divided by the sugar yield per ha, we obtain the area necessary for the cultivation of beet in 1977.

c. Potatoes

The area under potatoes tended to fall sharply in the period under review. In addition to labour and mechanization difficulties, the contracting marketing possibilities (reduction in consumption of ware potatoes along with increasing yields per unit area; substitution of fodder barley for potatoes as feed for pigs) played an important role. In the short term - i.e. from one year to the next - the marked fluctuations in the market prices for ware potatoes in the preceding period and in many years extreme weather conditions at the time of planting ought to have affected the area under potatoes. The weather conditions in the planting season (maincrop ware potatoes: April) will again be represented by the dummy variable "evaporation coefficient" since excessive soil moisture adversely affects the sprouting of potatoes too once they have been planted. The marketing possibilities (see above), which are tending to contract in the long term, were taken into account by means of a time variable.

A statistical check gave the following results:

Period: 1955-71

$$(24)\quad \log A(p) = +\,2.0893 + \underset{(3.1)}{0.11770}\ \log P(p)_{-1} - \underset{(35.7)}{0.02436}\ T$$

R^2 : 0.992 D.W. 1.52 $\dfrac{\hat{\sigma}}{\overline{\log A(p)}} = 0.6\%$

where:

A(p) = area under potatoes in June ('000 ha)

P(p) = market price for ware potatoes (main crop, excluding Dublin market) in £ per 100 kg

The weather dummy variable could not be secured against the nil hypothesis. The very low price sensitivity of the area under potatoes is striking (elasticity of areas in relation to the market price of ware potatoes: + 0.1).

d. Cows

Firstly, it must be pointed out that in the official Irish statistics milch cows include not only dairy cows proper but also beef cows; however, the latter account for only about 5–10% of the total number of cows.

The most important factors determining the number of cows in the period under review must be sought in the price of manufacturing milk and in the market prices of fatstock. There is much to indicate that under the conditions prevailing in Ireland farms keeping milch cows react in the long term not only to an increase in the price of milk but also to a rise in the price of beef by expanding the number of cows they keep. We derived this assumption from the fact that very many farmers keeping milch cows do not slaughter surplus calves shortly after birth but generally rear the animals themselves to the unfattened stage or – if the fodder position is adequate – fatten them until they are ready for the market. For farms keeping beef cattle, there ought in the long term to be a positive correlation only between the number of cows and the price of fatstock, while the level of the milk price plays almost no part.

At times the growth rate in the number of cows was unfavourably affected by the bovine tuberculosis eradication scheme (BTES). Up to 1957, participation in the BTES by farmers was voluntary and, consequently, few took part. Since 1958 all cows reacting positively to the tuberculin test have had to be slaughtered by law. From 1958 to 1963 this led to a sharp rise in the number of cows compulsorily removed from

the herd (in addition to healthy cows slaughtered because of their age). Only after 1964 did the number of cows slaughtered under the BTES decline again to such an extent that they became largely irrelevant as regards changes in the total number of cows. The effects of the BTES on the number of cows will be accounted for by means of a dummy variable given a value of 0 up to 1957, - 1 from 1958 to 1963 and 0 again from 1964. In order to step up the increase in the number of cows, which had virtually come to a standstill when the BTES was in full swing, the calved heifer subsidy scheme (CHSS) was introduced in January 1964. This provided for a once-only subsidy of £15 for each additional calved heifer (meaning those in addition to the heifers needed to replace the slaughtered cows). Particularly in the first two years after its introduction, farmers participated in the CHSS very actively and the growth rate in the number of cows improved accordingly one year later. In June 1969 the CHSS was ended and was replaced by the beef cattle incentive scheme (BCIS), the name of which gives sufficient indication of its purpose. Account will be taken of the influence of the CHSS and the BCIS on the growth of the number of cows by means of a dummy variable whose construction has already been described in connection with the development of the equation for the area under fodder barley. In addition, the price of mutton and lamb or the price ratio (mutton and lamb : milk) could also help to account for the number of cows since the keeping of ewes competes closely with cows in many regions in respect of the two production factors labour and pastureland.

Changes in both the price of beef and the price of milk can affect the number of cows only after a certain time-lag. We should like to give three examples which, in our opinion, show the most important of the possible alternatives:

- on a farm keeping milch cows the final decision as to the fate of female calves should always be taken immediately after the animals are born. A calf born in March 1970 and intended as an addition to the milch cow herd could be registered in the autumn of 1971 and would be shown in the statistics as a heifer in calf in June 1972 and as a milch cow only in June 1973. The decision as to the calf's fate taken in the spring of 1970 was probably based primarily on milk and beef prices in 1969.

- a farm which keeps milch cows and which generally rears most of its surplus female calves to the unfattened heifer stage (about 2 years) uses these store heifers in the short term to increase its herd of cows when the milk price rises. If, for example, milk prices during the 1969 grazing season were high, the farmer could decide not to sell some of his two-year-old store heifers for fattening in September/October and could have the animals covered. They would then appear in the statistics as calved heifers in June 1970 and as milch cows in June 1971.

- a farm which keeps milch cows sets aside every year some of its cows to be covered by beef bulls (Hereford, Aberdeen Angus, etc.) so as to obtain calves suitable for fattening. The female animals obtained from these crosses are generally lost to the herd as they are not really suitable to replace dairy cows or (on another farm) to replace beef cows. If the farm concerned plans to increase its herd of cows because of a favourable development in milk and/or beef prices in 1969, it must in the late summer of 1969 reduce the number of cows covered by beef bulls and increase the number covered by dairy bulls. The additional calves thus produced in order to increase the herd of cows would then be born in the spring of 1970, registered in the autumn of 1971 and included in the statistics as calved heifers in June 1972 and as milch cows in June 1973.

The first and third examples show a time-lag of - 4 and the second example - 2 (or with one-year old female calves - 3). The "normal case" is likely to be the second example so that with regard to the beef or milk price a lag in the region of - 2 or - 3 is to be expected and less frequently even a lag of - 4. The dummy variable "CHSS" or "BCIS" should really appear in the equation for determining the number of cows with a lag of - 1, since the level of this subsidy is known in advance so that in practice only the period which elapses between the first and second calves remains for detecting the influence of this subsidy on the number of cows. For the dummy "BTES", only an unlagged reaction can be assumed as tuberculosis-infected cows have to be slaughtered immediately.

The statistical check gave very good results; a dummy variable for the

"BTES" was not necessary:

Period: 1956-70

$$(25)\quad \log MC = +\underset{(2.9)}{2.8942} + \underset{(2.4)}{0.36638}\ \log\left(\tfrac{1}{2}\sum_{j=2}^{3} P(m)_{-j}\right) + 0.41797\ \log\left(\tfrac{1}{2}\sum_{j=2}^{3} P(bf)_{-j}\right)$$

$$- \underset{(2.8)}{0.37282}\ \log\left(\tfrac{1}{2}\sum_{j=2}^{3}\left(\frac{P(s)}{P(m)}\right)_{-j}\right) + \underset{(4.1)}{0.04790}\ D(c)_{-1}$$

R^2 : 0.958 D.W. : 0.73 $\dfrac{\hat{\sigma}}{\log MC} = 0.4\%$

where:

MC = total number of cows in June ('000)

P(bf) = auction price for bulls (Hereford Crosses) in Dublin (1961-70); up to 1960: estimated on basis of market prices for fatstock in Dublin (£ per 100 kg live weight)

P(s) = average price of fat sheep and lamb on the Dublin market (£ per 100 kg live weight)

Both the signs and the absolute value of the regression coefficients in (25) correspond to a priori expectations; other things being equal, an increase of 1% in the milk or beef price would cause a rise of 0.37% and 0.42% respectively in the number of cows. The elasticity of the number of cows in relation to the price ratio (mutton and lamb : milk) is, at - 0.37, of the same order of magnitude. The fact that on average Irish farmers expand their herd of cows at a somewhat slower rate when the milk price rises than when there is a more or less similar increase in the price of beef related to the breakdown of total earnings: in the years 1967-69, for example, 55.1% of total earnings from beef farming came from the sales of unfattened cattle and fatstock (including cows for slaughter) and 44.9% from sales of liquid milk and manufacturing milk. It is worth noting that, according to (25), the CHSS made a decisive contribution to increasing the

cattle numbers in the period under review (this can be deduced indirectly from the high t test value of the regression coefficient of D(c)).

e. Ewes

The keeping of ewes ought to be determined first of all by the market prices for fat sheep and lambs and, at least on hill and mountain farms, by wool prices. According to the results of (25), there ought also to be a clear relationship between the price of milk and the number of ewes. After 1966 the Irish Government tried to promote hill and mountain sheep farming by the mountain lamb subsidy schemes (MLSS) and (after 1969) the mountain hogget ewe subsidy scheme (MHES). Account will be taken of this by a dummy variable which has a value of nil up to 1965 and from 1966 onwards is approximately proportional both to the number of lambs or young ewes recorded each year and to the amount paid per animal (1966: 0.45; 1969: 6.01).

According to our investigations, the number of ewes responds to price changes after a time-lag of about three years. This will be explained by means of the following example: on a hill or mountain farm the ewes are covered in October/November 1969 so that they lamb in March 1970. The decision on what to do with the female lambs (to be reared as ewes or sold for fattening on the lowlands) is probably taken about the middle of 1970 after the lambs have been weaned, and is based mainly on 1969 prices. If it is decided to rear the lambs as ewes, the animals concerned are covered in October/November 1971 and appear as ewes in the statistics for the first time in June 1972. As regards the dummy variables for the MLSS and MHES, however, the lag should be shorter by one year as the level of the subsidies is generally announced before the beginning of the farm year.

The statistical check gave the surprising result that, apart from the dummy variables MLSS and MHES, only the milk price has a significant influence on the keeping of ewes. This influence could be adequately

accounted for only after the introduction of a time variable:

Period: 1957-71

$$(26)\quad \log EW = +3.5225 - \underset{(4.9)}{1.2951} \log \left(\tfrac{1}{2}\sum_{j=3}^{4} P(m)_{-j}\right) + \underset{(1.2)}{0.00702}\, D(s)_{-2} + \underset{(6.4)}{0.01365}\, T$$

R^2 : 0.791 D.W. : 1.23 $\frac{\hat{\sigma}}{\log EW} = 0.6\%$

where:

EW = number of ewes in June ('000)

D(s) = dummy variable for the MLSS and MHES (for details see text)

The elasticity of ewe keeping with reference to the milk price is very high at - 1.3. At first sight, the positive sign of the regression coefficient of the time variable is not easily explained. It indicates that during the period under review long-term factors must have been active which, regardless of the milk price trend and of the MLSS or MHES, have had a positive influence on the keeping of ewes. In this connection, it is possible that an important role is played by the fact that on many hill and mountain farms the lack of alternatives to sheep farming[1] (for example, the use of low-yield rough grazings) has led farmers to keep a larger stock of sheep than they would have planned to keep on the basis of the milk price alone.

f. Horses

The total number of horses in Ireland fell continually during the period under review (1958: 244 000; 1970: 124 000; - 49%) caused entirely by the large reduction in the number of working horses

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[1] If one disregards cattle farming.

Table 9 - Numbers, slaughterings and slaughter weight of horses, and the production and export of horse flesh in Ireland 1958-71

Year	Number ('000)	Slaughterings ('000)[a]	Average slaughter weight (kg)[a]	Production of horse flesh	Export of horse flesh to: (tons) [b]France	[b]Belgium	Value of exports of saddle horses (£ mill)
1958	244	.	.	.	.	.	.
1959	234	.	.	.	.	.	.
1960	224	.	.	.	.	.	.
1961	207	3	305	915	.	.	.
1962	196	7	286	2 118	.	.	.
1963	190	8	276	2 301	.	.	.
1964	180	11	290	3 249	.	.	.
1965	172	11	298	3 353	.	.	4.7
1966	158	11	287	3 251	2 032	1 016	4.8
1967	143	14	313	4 470	3 048	1 118	4.3
1968	134	13	301	3 861	3 251	508	5.2
1969	125	8	297	2 540	2 235	193	6.4
1970	124	.	.	2 794	2 540	224	6.8
1971	117	.	.	2 457	2 176	.	8.1

[a]Entirely for export.

Source: Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various editions; FAO, Production Yearbook, Rome, various editions; Own calculations.

(particularly, in agriculture). The number of horses kept for other purposes (above all, saddle horses) has, however, increased slightly in the last few years. In spite of the fact that their numbers are small, horses still have a special position in Irish agriculture even today. The fact that, traditionally, horse racing is a mass sport in Ireland and that, accordingly, horse breeding is practised extensively plays an important part. In this connection, the large number of saddle horses of all types exported to the United Kingdom, the U.S.A. and some continental European countries should be noted (1965-67: value = £4 600 000; 1969-71: value = £7 100 000). These figures include horses for show-jumping and Connemara ponies, for instance, as well as the supplies of saddle horses to the Swiss army (about 300 animals each year), which started again in the middle of the sixties. Horse breeding is encouraged a good deal by the Government (subsidies for draught horses under the General Horse-breeding Scheme and the Irish Draught Horse Scheme; even the Connemara Ponies Breeders Association receives subsidies from the Government). The Horse Industry Act of 1970 should also be mentioned as it provides inter alia for government support for the sale of Irish saddle horses abroad. The entire domestic production of horseflesh (see Table 9) is exported as there is no domestic demand. The most important customers are France and Belgium. Since 7 March 1965 the export of live slaughter horses to the Continent has been prohibited by law.

g. Pigs

The most important factor for pig farming is probably the price ratio (pigs for slaughter : fodder grain), and the fodder grain price is best represented by the price for fodder barley, since barley is by far the most important of the grains used for fattening pigs. A production branch rivalling pig farming is egg farming and, at regional level, above all in Munster, dairy farming. The increases in productivity which in the long term are probably greater in pig farming than in dairy farming will be represented by a time variable:

Period : 1955-70

$$(27)\quad \log SW = +\,0.30641 + \underset{(3.1)}{2.0365}\ \log \left(\frac{P(pb)}{P(bm)}\right)_{-1} - \underset{(1.6)}{0.56075}\ \log \left(\frac{1}{2}\sum_{j=1}^{2} P(m)_{-j}\right) + \underset{(1.6)}{0.00913}\ T$$

R^2 : 0.850 D.W. : 1.63 $\frac{\hat{\sigma}}{\log SW} = 1.6\%$

where:

SW = total number of pigs in June ('000)

P(pb) = market price (excluding Dublin market) for bacon pigs (£ per 100 kg slaughter weight)

P(bm) = retail price for barley meal in rural areas (£ per 100 kg)

Equation (27) shows clearly that the Irish pig breeders are very sensitive to changes in the price ratio (pigmeat : barley): an increase of 1% in this price ratio would, other things being equal, result in an increase of 2% in the number of pigs. The relatively low estimates for the constants also indicates that pig farming is, in general, highly sensitive to price changes. The assumed competition between pig and dairy farming, but not that between pig and egg farming, is confirmed by (27) (elasticity of number of pigs in relation to milk price: - 0.6). However, we should not conclude from this that egg farming in Ireland is virtually independent of pig farming, since in obtaining this result multicollinearity problems played a decisive role (as in (27) too; the not exactly high t test values of the partial regression coefficients are partly caused by the fact that the simple correlation coefficients between the time variables and each of the two price variables are + 0.8 and + 0.9). The regression coefficient of the time variable has a positive sign; this substantiates our hypothesis that the productivity gains in bacon pig farming in the period under review were greater than in dairy farming.

h. Eggs

Like pig farming, egg farming ought in the short term to be primarily dependent on the price ratio (eggs : fodder grain). In the long term, the falling domestic demand for eggs and the rapidly shrinking international markets along with rising egg yields have resulted in a downward trend in the number of laying hens; account is taken of this by a time variable for whose regression coefficients we expect a negative sign. In addition, the possibility that pig farming may have an influence on egg farming cannot immediately be dismissed, according to the results obtained under (g):

Period: 1954-69

$$(28)\quad \log LH = +\,3.9759 + \underset{(1.7)}{0.30095 \log \left(\frac{1}{2}\sum_{j=0}^{1}\left(\frac{P(eg)}{P(lm)}\right)_{-j}\right)} - \underset{(1.2)}{0.37185 \log \left(\frac{P(pb)}{P(bm)}\right)} - \underset{(10.7)}{0.01195\ T}$$

R^2 : 0.968 D.W. : 1.00 $\dfrac{\hat{\sigma}}{\overline{\log LH}} = 0.3\%$

where:

LH = number of laying hens in June ('000)

P(eg) = market price (excluding Dublin) for hen eggs (£ per 100 kg)

P(lm) = retail price for layers' mash in rural areas (£ per 100 kg)

The generally relatively low price sensitivity of egg farming that emerges from (28) and the - in absolute terms - higher elasticity of the number of laying hens in relation to the price ratio (pigs for slaughter : barley) than in relation to the price ratio (eggs : fodder grain) could be mainly due to the fact that in Ireland the keeping of free-range hens on a small scale - for example, as a subsidiary occupation for the farmer's wife - is still rather important. The fact that the "industrialization" of

egg production is still far less advanced in Ireland than it is in the United Kingdom, the Netherlands or Denmark is due to the shortage of capita and, above all, to the Irish agricultural policy, which even into the sixties did its best to hinder such a process.

i. Conclusions

We would not wish to conclude this survey without mention of the central role which, according to equations (22) to (28), the price of milk plays in determining both the extent and composition of Irish farm production. The price of milk appears as an important explanatory variable in the equations for determining the area under fodder barley, the number of cows, the number of ewes and the number of sows - this covers all the key products of Irish agriculture. Under these conditions, it is only logical that taking, for example, the average for the farm years 1966/67 to 1968/69, the Irish Government should devote by far the largest amount of its expenditure on agricultural support to milk producers (£19 500 000 or 38.5% of all expenditure).

2. Construction of the models for determining the gross domestic production of individual types of meat from given numbers of breeding animals.

a. Beef

First of all, it should be pointed out that we shall not attempt to explain the short-term, i.e. mainly cyclical, fluctuations in the gross domestic production of beef with the help of the model to be constructed. We shall be concerned more with calculating possible beef production (a type of long-term average) from a given number of cows on the basis of certain breeding, fattening and slaughtering practices (usually these are empirical values from the past which, however, may also be modified in exceptional cases in accordance with logical considerations). The total number of cows (TC) will be defined below as the number of milch cows (dairy and beef cows; MC) plus the number of heifers in calf (HC) (these and all other data on stock numbers refer to the situation in June of each year concerned) /in '000/:

(29) TC = MC + HC

In (29) we already know MC: still to be "determined" is the number of heifers in calf (in relation to the total number of cows). As Table 11 shows, the proportion of heifers in calf in the total number of cows undergoes marked cyclical fluctuations - that means that it is fairly low in periods when farmers plan minor changes or no changes at all in the number of cows they keep (1962: 9.8%; 1966: 9.5%) and relatively high in periods when they are attempting an intense build-up in numbers (1964/65: 11.9%; 1970/71: 10.8%). Under Community conditions, we expect a sharp increase in the number of cows in every case, so that it seems appropriate in our estimates to assume a proportion of heifers in calf in the total number of cows which is not lower than the figure for the last two years:

(30) MC = determined previously by equation (25)

(31) HC = 0.11 TC

Equations (29) to (31) can be combined to give:

Table 10 Numbers and slaughtering of cattle and calves in Ireland 1958-71

('000)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Numbers (June)															
Milch cows	1 260	1 278	1 284	1 291	1 309	1 323	1 400	1 547	1 582	1 568	1 607	1 657	1 713	1 782	1 895
Heifers in calf	130	137	122	127	142	160	202	193	166	178	183	178	196	227	
Bulls for service	17	17	18	17	16	16	15	15	15	14	14	14	15	15	
Other cattle:															
over 3 years	207	229	273	263	238	228	201	221	224	219	213	212	208	198	
2 to 3 years	703	792	843	838	799	828	792	808	896	922	897	903	932	954	
1 to 2 years	1 040	1 095	1 098	1 077	1 078	1 139	1 120	1 216	1 325	1 349	1 295	1 322	1 403	1 409	
under 1 year	1 108	1 142	1 103	1 101	1 160	1 168	1 233	1 359	1 382	1 337	1 364	1 402	1 489	1 549	
Cattle-total	4 466	4 684	4 741	4 713	4 742	4 860	4 962	5 359	5 590	5 586	5 572	5 688	5 957	6 134	6 460
Slaughterings															
Cattle-total	405	485	525	636	580	532	482	485	609	946	810	827			
of which:															
cows slaughtered by meat exporting industry	.	228	245	215	270	231	160	163	256	307	268	255	232		
fatstock slaughtered by meat exporting industry	.	91	132	256	141	175	141	150	174	446	353	378	465		
fatstock slaughtered for domestic needs	.	166	148	165	169	186	181	172	179	193	189	194			
Calves slaughtered	4	3	5	4	6	7	6	6	9	6	6	5			
Slaughter weights (kg)[b]															
Cattle-total	192	186	208	227	216	218	233	232	221	235	238	239			
Calves	91	91	91	91	91	91	91	91	91	91	91	91			

[a] Equivalent to at least 90% of total cows slaughtered. [b] Weight of slaughtered and gutted cattle, including bones and trimmed fat but excluding skin, hooves, head, offal and offal fat.

Source: See Table 6*

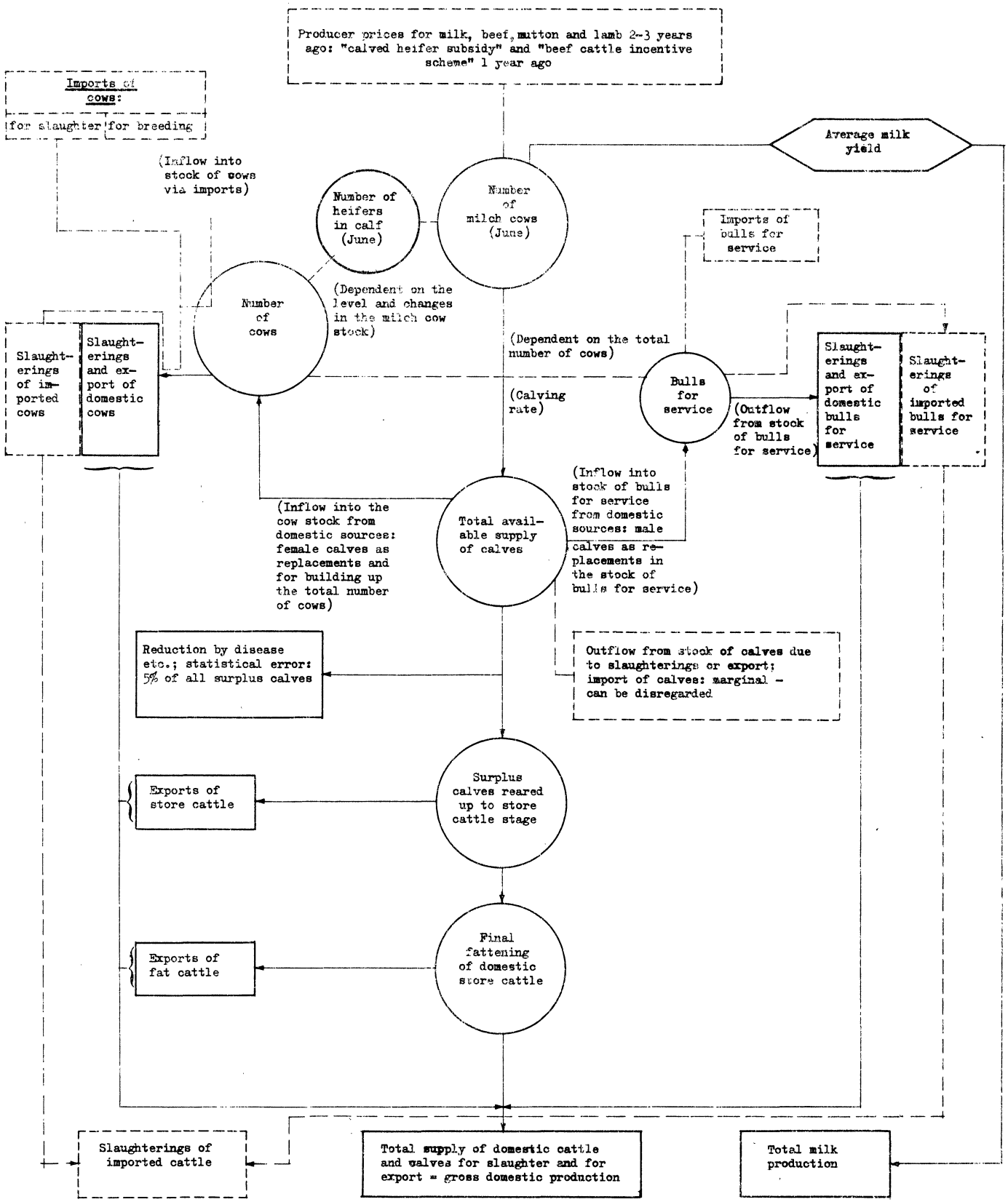
Table 11 - Analysis of the structure of the cattle stock in Ireland 1962-71

('000)

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
I. Estimate of the calving rate										
1. Number of cattle under 1 year (June)[a]	1 160	1 166	1 233	1 359	1 382	1 337	1 364	1 402	1 409	1 549
2. Number of milch cows (June)[b]	1 309	1 323	1 400	1 547	1 582	1 568	1 607	1 657	1 713	1 782
3. Calving rate (%) (1 : 2) x 100	88,6	88,3	88,1	87,8	87,4	85,3	84,9	84,6	86,9	86,9
II. Increases and decreases in the number of cows										
4. Number of heifers in calf (June)	142	160	202	193	166	178	183	178	196	227
5. Total number of cows (2 + 4)	1 451	1 483	1 602	1 740	1 748	1 746	1 790	1 835	1 909	2 009
6. Proportion of heifers in calf in total number of cows (%) (4 : 5) x 100	9,8	10,8	12,6	11,1	9,5	10,2	10,2	9,7	10,3	11,3
7. Overall change in number of cows	33	32	119	138	8	- 2	44	45	74	100
8. Decrease in number of cows as a result of:										
8a. Domestic slaughtering	270	231	160	163	256	307	268	255	232	
8b. Export	8	9	18	25	30	13	15	10	16	23
9. Percentage turnover in number of cows [(8a + 8b) + (5)] x 100[d]	19,2	16,2	11,1	10,8	16,4	18,3	15,8	14,4	13,0	
10. Additions to number of cows (8a + 8b + 7)	311	272	297	326	294	318	327	310	322	
10a. From domestic sources	262	228	263	301	266	278	292	276	293	
10b. From imports of live cows	49	44	34	25	28	40	35	34	29	25
III. Increases and decreases in the number of bulls for service										
11. Number of bulls for service	16	16	15	15	15	14	14	14	15	15
12. Change in number of bulls for service	- 1	0	- 1	0	0	- 1	0	0	1	0
13. Decrease in number of bulls for service as a result of:										
13a. Domestic slaughterings	1	1	0	0	0	1	1	1	1	1
13b. Export	2	2	4	4	3	1	1	0	2	1
14. Percentage turnover in number of bulls for service [(13a + 13b) : (11)] x 100	18,8	18,8	26,7	26,7	20,0	14,3	14,3	7,1	20,0	13,3
15. Additions to number of bulls for service (13a + 13b + 12)	2	3	3	4	3	1	2	1	4	2
15a. From domestic sources	1	2	1	2	2	0	1	0	3	2
15b. From imports of live bulls for service	1	1	2	2	1	1	1	1	1	0
IV. Consistency test for use of calves										
18. Exports of unfattened and fat bullocks and heifers and of calves	566	652	772	567	592	657	611	540	513	593
19. Imports of unfattened and fat bullocks and heifers and of calves	51	95	112	75	45	116	99	94	134	68
20. Domestic slaughterings of fat bullocks and heifers and of calves	317	368	328	328	362	645	548	577		
21. Unfattened and fat bullocks and calves from domestic sources actually marketed	832	925	988	820	909	1 186	1 060	1 023		
22. Number of home-bred calves originally available for live export or domestic slaughter	897	938	969	1 056	1 114	1 059	1 071	1 126		
23. Calves actually used for live export or fattening as % of number originally available for these purposes (21 : 22) x 100	92,8	98,6	102,0	77,7	81,6	112,0	99,0	90,9		

[a] The number of calves in June largely corresponds to the number of calves reared, since the majority of cows calve in March/April; slaughterings of new-born calves are of only minor importance. [b] All cows that give milk, i.e. both pure dairy cows and beef cows; it is estimated that beef cows account for only 5% of the total number of milch cows. [c] Own estimate. [d] In addition, about 20 000 cows per annum are slaughtered in Ireland for domestic requirements so that the percentage turnover in the number of cows should be taken as being slightly higher; exact figures for the various years are not available. Including about 20 000 cows slaughtered per annum (see note d).

Diagram 6 - Diagram of the model for determining the gross domestic production of beef, and milk production in Ireland



(32) TC = 1.1236 MC

Traditionally, the slaughtering of and external trade in calves play a very minor role in Ireland. Taking the average of the years 1962 to 1971, these activities (domestic slaughter of calves plus live exports less live imports) involved barely 3 000 animals each year. As the vast majority of cows calve in the spring, the number of "cattle under 1 year" registered in June ought to be a very reliable indication of the total number of domestic calves available for breeding (TCCA). If the number of cattle under 1 year is compared with the number of milch cows in June, we obtain some idea of the extent of the calving rate (Table 11). According to this, the calving rate fell continuously from 88.6% in 1962 to 84.6% in 1969; then it rose again to 86.9% in 1970/71. We are unable to provide a plausible explanation for this trend; solely as a precaution a calving rate of 87.0% will be taken for the estimate, even though a further increase to 88.0% or 90.0% is conceivable by 1977 or 1979[1].

(33) TCCA = 0.87 MC

From the available female calves, priority must be given to covering the total inflow into the stock of cows (CRT), which corresponds to the outflow of cows for domestic slaughter (SLCW) plus the live exports of cows for breeding and slaughter (EXCW) and the change in the total number of cows:

(34) $CRT = (SLCW + EXCW) + (TC - TC_{-1})$

The turnover in the number of cows was increased considerably between 1958 and 1963 because of the BTES (see III,1,d). If cyclical fluctuations are disregarded, a value of about 15.5% is obtained for the last few years (ø 1966-70), and we shall use this in the forecast (see also Table 11,

---

[1] In equation (25) we saw that the number of cows reacts to price changes with a lag of at least 2 years. If the possibility of an "advance adjustment" is ruled out, the number of cows resulting from 1977 prices must be seen to refer to 1979.

lines 8 and 9):

(35) $(SLCW + EXCW) = 0.155\ TC$

The inflow into the cow stock must come predominantly from the domestic calves available but may also be covered, to some extent, by imports of breeding stock. In addition, account must also be taken - as a purely transit item - of the imports of cows for slaughter, which are included in the number of domestic slaughterings of cows.

(36) $CRTH = CRT - IMCW$

where:

CRTH = inflow into stock of cows from domestic sources ('000)

IMCW = imports of cows for breeding and for slaughter ('000)

The future imports of cows of all types can be treated only as an exogenous variable in this model. It is to be assumed that in 1977 or 1979 30 000 cows (predominantly slaughter animals from Northern Ireland to be exported as boxed boneless beef to the U.S.A.) will be imported (see Table 11, line 10b):

(37) $IMCW = \text{exogenous } [= 30\ 000]$

Equations (34) to (36) can be combined as follows:

(38) $CRTH = 0.155\ TC + (TC - TC_{-1}) - IMCW$

$= 1.555\ TC - TC_{-1} - IMCW$

$= 1.555\ (1.1236)\ MC - 1.1236\ MC_{-1} - IMCW$

$= 1.29775\ MC - 1.1236\ MC_{-1} - IMCW$

The number of bulls for service (BS) in 1977 or 1979 is given as a percentage of the number of cows; 1962-64 = 1.038%; by 1969-71 this figure had fallen to 0.765%, which was largely attributable to a more selective breeding policy, made possible above all by the rapid widespread use of

artificial insemination. This development (proliferation of artificial insemination) has not yet come to a complete halt, but has lost considerable momentum. Consequently, in order to be on the safe side we estimate that in 1979 bulls for service will account for 8% of the total number of cows:

(39) $BS = 0.008\ TC$

The inflow (total and net - i.e. animals taken from domestic supply of calves) into the stock of bulls for service was determined in the same way as for the inflow into the stock of cows (see also Table 11, lines 11-15):

(40) $BRT = (SLBS + EXBS) + (BS - BS_{-1})$

(41) $(SLBS + EXBS) = 0.18\ BS$

(42) $BRTH = BRT - IMBS$

(43) $IMBS = \text{exogenous}\ [= 1\ 000]$

where:

BRT	= total inflow into the stock of bulls for service ('000)
BRTH	= inflow into the stock of bulls for service from domestic sources ('000)
SLBS or EXBS	= domestic slaughterings of bulls for service in Ireland and live exports of bulls for service ('000)
IMBS	= imports of bulls for service of all types ('000)

Equations (39) - (42) can be combined as follows:

$$
\begin{aligned}
(42)\quad BRTH &= 0.18\ BS + (BS - BS_{-1}) - IMBS \\
&= 0.18\ (0.008)\ TC + (0.008\ TC - 0.008\ TC_{-1}) - IMBS \\
&= 0.18\ (0.008)(1.1236)\ MC + (0.008)(1.1236)\ MC - (0.008)\ (1.1236)\ MC_{-1} - IMBS \\
&= 0.001618\ MC + 0.008989\ MC - 0.008989\ MC_{-1} - IMBS \\
&= 0.010607\ MC - 0.008989\ MC_{-1} - IMBS
\end{aligned}
$$

If the calves required as replacements in the stock of cows and bulls is substracted from the total number of calves intended for rearing, we obtain the supply of calves theoretically available for fattening or for export as store cattle (CVFE):

(45) CVFE = TCCA - (CRTH + BRTH).

If rearing losses, the variations in the stock of fat cattle and statistical errors are taken into account, there remains for fattening and for export as store cattle (CVFEA) in the calendar year in question (see Table 11, lines 18-23):

(46) CVFEA = 0.95 CVFE.

Now the gross production (BEZB; '000 kg slaughter weight) can also be determined after assumptions have been made about the relevant average slaughter weights:

(47) BEZB = [(SLCW + EXCW) - IMCW] x [average slaughter weight of cows]
+ [(SLBS + EXBS - IMBS] x [average slaughter weight of bulls]
+ [CVFEA] x [average slaughter weight of store or cattle stock].

We assume a slaughter weight of 225 kg for cows and 235 kg for bulls in 1977 or 1979. The item CVFEA requires further explanation. In the survey on the United Kingdom we estimated that in 1977 the United Kingdom would import 180 000 store cattle from Ireland, for which an average slaughter weight of 220 kg was assumed[1]. If these 180 000 store cattle are subtracted from the value of CVFEA, we obtain the number of fat cattle available in 1977 or 1979, for either domestic slaughter or live export, to continental EEC countries, for example (average slaughter weight of all fat cattle: 235 kg).

---

[1] In Great Britain we took an average slaughter weight of only 200 kg for imported Irish stores - the resulting difference of 20 kg is in any case larger than the animals' normal loss of weight during transport. This small error had to be accepted in order to ensure for both countries a certain continuity with past statistical data.

b. Mutton and lamb

As Table 12 shows, we have no data on the structure of the slaughterings of sheep and lambs - meaning that the slaughterings of ewes, rams, hoggets and lambs for fattening are not recorded separately. For this reason, the model for determining the gross domestic production of mutton and lamb cannot be as detailed as that for beef. We can only construct a type of balance equation for the use of the total number of lambs available for rearing.

The basis taken for the model is the number of ewes in June (EW; these and all other data on the numbers of stock are given in 1 000 head and refer to the situation in June of each year concerned), which has already been explained under III, 1 e.

(48) EW = determined previously by equation (26).

As lambs are born almost exclusively in the months of March and April, the number of sheep in June under one year old, expressed as a percentage of the number of ewes, gives a fairly accurate picture of the lamb rearing rate (lambing rate, if "lambs born" is defined as only those born live, suitable for rearing and actually incorporated in the sheep stock - see Table 12; stock data). Between 1958 and 1965 the lamb rearing rate fluctuated between 100 and 105%, then it fell to 98% in 1966-71. The reason for this was undoubtedly the following trend: up to 1965 the proportion of sheep kept on lowlands in the total number of sheep tended to rise as a result of the extremely rapid increase in the numbers of mutton sheep in Leinster. After 1966 the numbers of mutton sheep in Leinster were drastically reduced for price reasons, while in the hill and mountain areas (Connacht, Ulster) sheep farming contracted much more slowly and since 1970 has even been slowly expanding again, so that after 1966 the proportion of hill and mountain sheep in the total number of sheep rose accordingly. As the lamb rearing rate in hill and mountain areas, both for climatic reasons and because of the less adequate fodder supply and the larger number of natural enemies, is very much lower than in the lowlands, the lamb rearing rate of the total stock and the proportion of

Table 12 - Numbers, slaughterings and important stock data for sheep in Ireland 1958-71
('000)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Numbers (June)														
Ewes	1 772	1 864	1 837	1 927	2 041	2 085	2 200	2 197	2 084	1 936	1 882	1 853	1 844	1 888
Rams for service	57	59	57	62	66	65	67	66	63	58	55	53	51	51
Other sheep														
1 year or more	510	554	592	511	520	457	477	482	444	357	339	335	364	396
under 1 year	1 835	1 934	1 829	2 027	2 045	2 084	2 206	2 270	2 073	1 888	1 801	1 765	1 824	1 854
sheep - total	4 174	4 412	4 314	4 528	4 671	4 691	4 950	5 014	4 664	4 239	4 077	4 006	4 082	4 189
Slaughterings														
Sheep and lambs - total	1 204	1 368	1 513	1 398	1 856	1 911	1 849	1 752	1 943	1 755	1 697	1 655		
of which:														
slaughtered for meat export[a]	.	416	548	440	786	896	850	783	941	744	706	628	439	783
slaughtered for domestic needs	.	952	965	058	1 070	1 015	999	969	1 002	1 011	991	1 027		
Slaughter weights (kg)[b]														
Sheep and lambs - total	27	27	26	27	25	25	25	26	25	26	26	26		
for meat export	17	18	17	20	17	18	18	19	18	18	18	18	18	18
for domestic needs	.	31	31	31	30	32	32	32	31	32	32	32		
Stock data														
Lambing rate (number of lambs under 1 year as % of number of ewes)	103,6	103,8	99.6	105.2	100,2	100,0	100,3	103,3	99.5	97,5	95.7	95,3	98,9	98,2
Outflow from the sheep stock due to:														
domestic slaughterings of sheep and lambs ('000)	1 204	1 368	1 513	1 398	1 856	1 911	1 849	1 752	1 943	1 755	1 697	1 655		
live exports ('000)	196	246	310	349	382	329	314	232	182	141	161	91	66	127
Total outflow ('000)	1 400	1 614	1 823	1 747	2 238	2 240	2 163	1 984	2 125	1 896	1 858	1 746		
Change in number of sheep ('000)	454	238	- 98	214	143	20	259	64	- 350	- 425	- 162	- 71	76	85
Inflow into sheep stock:														
from domestic sources ('000)	1 760	1 602	1 485	1 594	1 969	1 867	2 167	1 916	1 666	1 328	1 530	1 548		
from live imports ('000)	94	250	240	367	412	393	255	132	109	143	166	127	146	191
Total inflow ('000)	1 854	1 852	1 725	1 961	2 381	2 260	2 422	2 048	1 775	1 471	1 696	1 675		
Outflow as % of total number of sheep	33,5	36.6	42,3	38,6	47,9	47,8	43,7	39,6	45,6	44,7	45,6	43,6		
Inflow from domestic sources as % of total lamb births[d]	95,9	82.8	81,2	78,6	96.3	89,6	98,2	84,4	80,4	70,3	85,0	87,7		
Total number of sheep as % of number of ewes	235,6	236,7	234,8	235.0	228.9	225,0	225,0	228,2	223,8	219,0	216,6	216.2	221,4	221,9

[a] From 1967 own estimates. [b] Weight of slaughtered and gutted animals, including bones and trimmed fat but excluding skin, hooves, head, offals and offal fat.
[c] From 1967 own assumption. [d] Represented by the number of sheep under 1 year.

Sources: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO, Production Yearbook, Rome, various issues. Own calculations and estimates.

sheep kept in hill and mountain areas in the total stock have a negative correlation. The decline in TLC (lamb rearing rate) after 1966 can be accounted for by this negative correlation and by the increase in the proportion of hill and mountain sheep after 1965. As will be shown below, we expect, under EEC conditions, a further rise in the proportion of hill and mountain sheep so that for 1977 or 1980[1] the lamb rearing rate can be expected to be somewhat lower than the ∅ 1969-71 value of 97.5%:

(49) TLC = 0.95 EW.

Account must now be taken of the outflow of lambs after June (for example as a result of disease, straying in the hills, etc.) and also of the statistical errors in order to obtain the number of sheep and lambs actually available for slaughter or live export and for building up the stock (TLCS) (see Table 12; stock data):

(50) TLCS = 0.895 TLC.

Equations (49) and (50) can be combined to give:

(51) TLCS = 0.895 (0.95) EW = 0.85 EW.

The total number of sheep (TS) in relation to the total number of ewes dropped from 236% (1958-60) to 220% (1969-71); this is a direct consequence of the fall in the lamb rearing rate (more restricted supply of lambs for a given number of ewes) resulting from the increase in the proportion of hill and mountain sheep. Accordingly, the assumption on the ratio (total number : number of ewes) for 1977 or 1980 must be based closely on the lamb rearing rate:

(52) TS = 2.15 EW.

---

[1] Equation (26) shows that the number of ewes reacts to price changes with a lag of three years. Consequently, the number of ewes resulting from complete adaptation to 1977 prices would not be attained until 1980.

The value TLCS must be divided into domestic slaughterings and live exports, on the one hand, and the animals necessary for stock replenishing, on the other, with imports of live sheep being eliminated from the total number of domestic slaughterings:

(53) $TLCS = (SLS + EXS) - IMS + (TS - TS_{-1})$

(54) IMS = exogenous (= 200 000)

where:

SLS and EXS = domestic slaughterings of sheep and lambs of all types and live exports respectively ('000)

IMS = imports of live sheep ('000).

When (52) is applied, the change in the total number of sheep ($TS - TS_{-1}$) becomes:

(55) $TS - TS_{-1} = 2.15\ (EW - EW_{-1})$.

From the "balance equation" (53) on the use of lambs, the value (SLS + EXS) can be determined when TLCS, IMS and the change in numbers ($TS - TS_{-1}$) are known. The consistency of this estimate can be checked by the turnover rate of the sheep stock, which in recent years stood at 40–45% (see Table 12: stock data):

(56) $0.40 < \left(\frac{SLS + EXS}{TS}\right) < 0.45$.

If an average slaughter weight for sheep and lambs together of 25 kg is taken for 1980, the gross production (BEZS: '000 kg) is calculated as follows:

(57) $BEZS = [(SLS + EXS) - IMS] \times 25$.

c. Pigmeat

The equation for determining the number of sows (SW) was developed in III, 1 g:

Table 13 - Numbers, slaughterings, slaughter weights and slaughter rates of pigs in Ireland ('000) 1958-71

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Numbers														
Pigs - total	96.7	92.2	109.4	121.0	123.6	123.1	133.5	139.3	102.9	110.4	116.1	120.4	136.9	147.6
Sows in pig	.	.	90.8	106.0	57.2	60.3	64.9	71.8	52.2	54.3	59.9	60.7	72.8	77.0
Other sows	.	.			54.6	50.5	52.0	55.5	42.5	43.2	45.5	47.6	50.2	56.7
Gilts	.	.	18.6	15.0	11.8	12.3	16.6	12.0	8.2	12.9	12.7	12.1	15.9	13.9
Boars for service	2.1	2.1	2.6	2.9	3.3	3.3	3.2	3.6	2.8	2.6	2.5	2.7	2.6	2.9
Other pigs -total	848.8	757.8	839.1	932.6	963.7	975.6	971.4	1069.0	907.8	871.9	942.8	992.6	1050.9	1172.0
6 months old and over	418.2	363.0	424.8	485.7	72.8	68.2	64.1	77.1	64.8	66.6	66.7	69.4	64.9	70.5
3 months old and under 6 months					422.8	425.7	417.7	424.5	410.2	378.6	407.4	443.9	464.9	522.6
under 3 months	430.6	394.8	414.3	446.9	488.1	481.7	489.6	517.4	432.8	426.7	468.7	479.3	521.1	578.9
Pigs - total	947.7	852.2	951.1	1056.4	1100.6	1102.0	1108.0	1265.9	1013.5	984.9	1063.3	1115.5	1192.4	1322.5
Slaughterings														
Pigs - total	1478	1290	1400	1564	1685	1678	1708	1979	1793	1560	1784	2075	2087	
slaughterings in bacon factories - total	1367	1178	1298	1462	1571	1554	1567	1797	1644	1449	1650	1936	1948	2108
for bacon production	1267	1078	1172	1312	1294	1290	1357	1401	1433	1312	1426	1482	1588	1618
for pork production	50	52	78	101	226	204	154	332	157	97	180	409	314	444
for sausage production	47	46	47	48	49	55	52	59	50	35	38	36	41	42
on commission for farmers	3	2	1	1	2	5	4	5	4	5	6	9	5	4
farm slaughterings	111	112	102	102	114	124	141	182	149	111	134	139	140	
Slaughter weights (kg)														
All pigs	68	68	68	68	67	69	71	70	70	70	69	68	68	
Bacon pigs	65	67	66	66	66	66	68	67	67	68	68	67	66	65
Slaughter rate														
Number of pigs slaughtered per sow - total	15.3	14.0	12.8	13.0	13.6	13.6	12.8	14.2	17.4	14.1	15.1	17.2	15.0	

Source: Central Statistics Office. Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Pigs and Bacon Commission, Report of Proceedings and Statement of Accounts for the year ended.... Dublin, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO Production Yearbook, Rome, various issues. Own calculations and estimates.

(58) SW = determined previously by equation (27)

The average number of pigs for slaughter available per sow in one year rose from 14.0 (1958–60) to 15.8 (1968–70); for 1977 or 1978[1] we are assuming a value of 16.0 (see also Table 13):

(59) SLP = 16.0 SW

where:

SLP = total supply of pigs for slaughter ('000).

If the marginal external trade in live pigs in the period under review is disregarded and if an average slaughter weight for all pigs of 70 kg is assumed for 1978, the following equation gives the gross domestic production (BEZP) or net production (NPP) in 1 000 kg:

(60) BEZP = $\underline{/}$(16.0 x SW) x 70.$\underline{0}$7 = NPP.

The breakdown of BEZP or NPP into pork and bacon production can be based primarily on the demand estimates for these two types of meat and also on the forecast of the import requirements for pork and bacon in the United Kingdom.

---

[1] The equation for determining the number of sows shows that the latter reacts to price changes with a lag of one year. The number of sows corresponding to 1977 prices will, therefore, be attained in 1978.

IV. Forecast of the supply of agricultural products

1. Forecast of the areas under cultivation and the female breeding stocks using the model equations; discussion and revision of results

a. General introductory comments

The critical examination of the forecast values for the areas under cultivation and the female breeding stocks will be carried out first in accordance with logical considerations (in particular, discussion of the possible effects of factors which are important under EEC conditions but which are, however, not taken into account in the equations) and later, on a more aggregated basis, by means of the test of the area under cultivation (including a test of the stocking rate of pastureland). In addition, we have the opportunity, for a number of products, of comparing our estimates with the results of a comprehensive survey carried out among Irish farmers[1] with a view to Ireland's accession to the EEC. As this survey was financed by the Irish Flour Millers' Association, the sample of farmers interviewed was not so compiled as to be representative of Irish agriculture as a whole. It tended to be biased towards the large arable farms in eastern areas which grow considerable amounts of wheat. The farmers selected for the survey by the staff of the agricultural advisory department on the basis of specific criteria were sent a questionnaire on which they were asked to give their farming plans for 1970, 1972 and 1975. The replies for 1975 were to assume that Ireland was a member of the EEC and had accepted the EEC agricultural policy system and farm prices without significant changes. The "EEC conditions" were described as well as possible in the questionnaire by the authors of the survey; in particular the producer prices expected in the EEC for the most important products were

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[1] Seamus J. Sheehy and Marcus J. McInerney, Farmers' Production Response to Prospective EEC Conditions, Department of Applied Agricultural Economics, University College, Dublin, Report No. 1, November 1970.

listed separately. The farming plans were supposed to give full details for the following products: wheat, barley for malting and fodder, sugar beet, cattle and sheep. Not included were oats, potatoes, rape, pigs and poultry. Even though the replies received to this survey represent no more than declarations of the intentions of a small group of farmers who, furthermore, are not very representative of the rest of agriculture, the results of the survey can provide useful information on various problems.

b. Cereals

Using equation (22) an area under wheat of 31 000 ha was forecast for 1977 (actually 1978) (1969/71: 89 000 ha; reduction of 68%). About one-third of this value is attributable to the price influence (fall in the price ratio [wheat : fodder barley] of just 20% between 1967/69 and 1977, with an elasticity of the area under wheat in relation to this price ratio of + 0.98) and two-thirds to the trend influence. In the past the highly negative trend effect was due mainly to the wheat market regulations (milling quotas). The EEC organisation of the cereals market does not contain any quantitative restrictions so that it appears advisable to eliminate the trend effect when forecasting with equation (22), and to allow the price effect alone to act. Under these conditions, the area under wheat (about 60 000 ha) would be "only" 33% smaller in 1977 than in 1969/71[1]. This result agrees well with the results of the Irish farm survey: the farmers interviewed planned to reduce the area under wheat by 30% between 1970 and 1975. The extensive Irish fertilizer subsidies, from which wheat also benefits, will have to be suspended under EEC conditions. However, wheat and barley will be affected to a similar extent by this so that, in our view, there is no need to take explicit account of the "fertilizer price" factor in an estimate based on the price ratio between the two cereals.

Before forecasting the area under fodder barley by means of equation (23), an assumption must be made on the value of the dummy variables "CHSS"

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[1] Cf. Table 14.

Diagram 7 - The area under wheat and the price ratio (wheat : fodder barley) in Ireland 1955-72, 1977

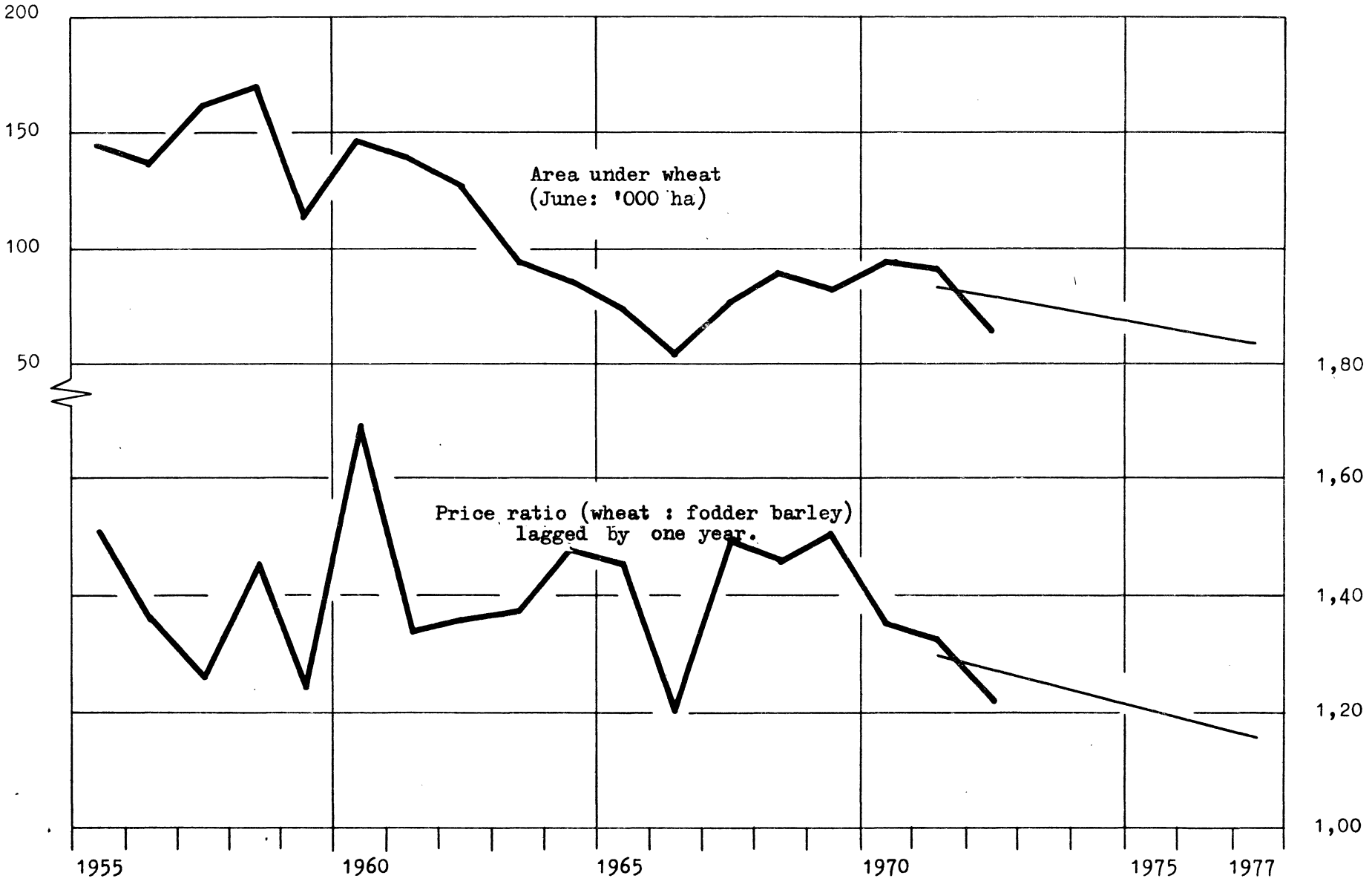


Table 14 - Results of the forecast of the areas under cultivation and the female breeding stocks in Ireland for 1977

	ø 1969/71	1977	Percentage change ø 1969/71 to 1977	Average annual percentage change ø 1969/71 to 1977
Wheat ('000 ha)	89	60	- 32.6	- 5.5
Barley ('000 ha)	216	230	+ 6.5	+ 0.9
Oats ('000 ha)	68	45	- 33.8	- 5.7
Sugar beet ('000 ha)	27	26	- 3.7	- 0.5
Potatoes ('000 ha)	55	35	- 36.4	- 6.3
Milch cows ('000)	1 717	2 700	+ 57.3	+ 6.7
Ewes ('000)	1 862	2 000	+ 7.4	+ 1.0
Sows ('000)	136	100	- 26.5	- 4.3
Laying hens ('000)	4 951	3 400	- 31.3	- 5.2

Source: cf. Tables 10,12 and 13 and 1*,2*,3*,4*,5* and 17*.
Own calculations and estimates.

and "BCIS" in 1977. We assume that in the enlarged EEC special subsidies for beef cows which, from the farmer's standpoint, will be approximately equivalent to the grants given under the BCIS will replace the BCIS. Then dummy D(c) could be given the value of nil - this means no appreciable change in the subsidies for beef cows (to avoid misunderstandings, it is pointed out that, for example, if the BCIS were abolished without being replaced, D(c) would have a negative value (-1.0). On this assumption, we obtain from (23) for 1977 (actually 1978) an area under fodder barley of 150 000 ha (1969/71: 165 000 ha; fall of 10%). The determining factor for this result is the extremely strong negative effect of the milk price (increase in milk price from 1967/69 to 1977 of 123% with an elasticity of the area under barley in relation to the milk price of - 1.3), which is not entirely offset by the positive effect of the time trend and the price ratio (wheat : fodder barley). The positive trend influence in the period under review is a result of the milling quotas and the promotion of fodder barley cultivation by the support price system. Under EEC conditions the milling quotas will be abolished; however, the EEC intervention system for cereals will replace the Irish support price system so that even in future a certain positive trend influence is possible.

An obvious shortcoming of (23) as regards forecasting is the fact that the milk price appears in absolute terms in this equation. As a result, the information that the rise of 123% in the milk price from 1967/69 to 1977 is accompanied by a 65% increase in the price of fodder barley is virtually suppressed ("level effect"). To take account of the level effect, one could, for example, introduce in (23) a rise of 35% in the milk price - that is the percentage by which the price ratio (milk : fodder barley) would increase from 1968/69 to 1977. This would give for 1977 an estimated value of about 280 000 ha for the area under fodder barley (increase compared with 1969/71 : 70%) - a fairly optimistic estimate when one considers that on the basis of the Irish farmers' questionnaire an increase of 37% in the area under fodder barley covered by the random sample is obtained for the period 1970-75! Against this background, the estimate of the area under fodder barley obtained in (23)

and using the absolute milk price appears more as the lowest possible value and the estimate based on the rise in the price ratio (milk : fodder barley) as the highest possible value. As a compromise, we shall assume for 1977 an area under fodder barley of 180 000 ha, which represents a 9% increase compared with 1969/71.

c. Potatoes

Using equation (24), an area rounded off to 35 000 ha was estimated for the cultivation of potatoes in 1977 (actually 1978) (1969/71: 55 000 ha; reduction of 38%). Only an infinitely small part of the estimated contraction in the area under potatoes is price-induced since, according to our hypotheses, the price of potatoes would drop by only 4% from 1967/69 to 1977 and since, in addition, potato-growing is not very sensitive to price changes (elasticity of area under cultivation in relation to price: + 0.12).

The determining factor in the forecast is the very negative trend influence, by which both the declining domestic demand for ware potatoes and the substitution of barley for potatoes in pig feeding in the period under review were taken into account. According to the demand forecast, the domestic consumption of ware potatoes will continue to fall in the future. It must also be taken into consideration that under EEC conditions the position of potatoes in the farm price structure will deteriorate considerably (negative "level effect"). These two factors indicate that the negative trend influence will continue in the forecasting period. The only factor pointing to the contrary is that the high fodder grain prices in the EEC could bring to a stop the process whereby barley is replacing fodder potatoes in bacon pig production (the opposite might even happen - replacement of barley by fodder potatoes). However, one argument against this is that in the past the replacement of fodder potatoes by barley was due less to prices than to labour considerations. However, if this argument does not hold, there seems no reason to revise the forecast value obtained from (24).

d. Number of cows

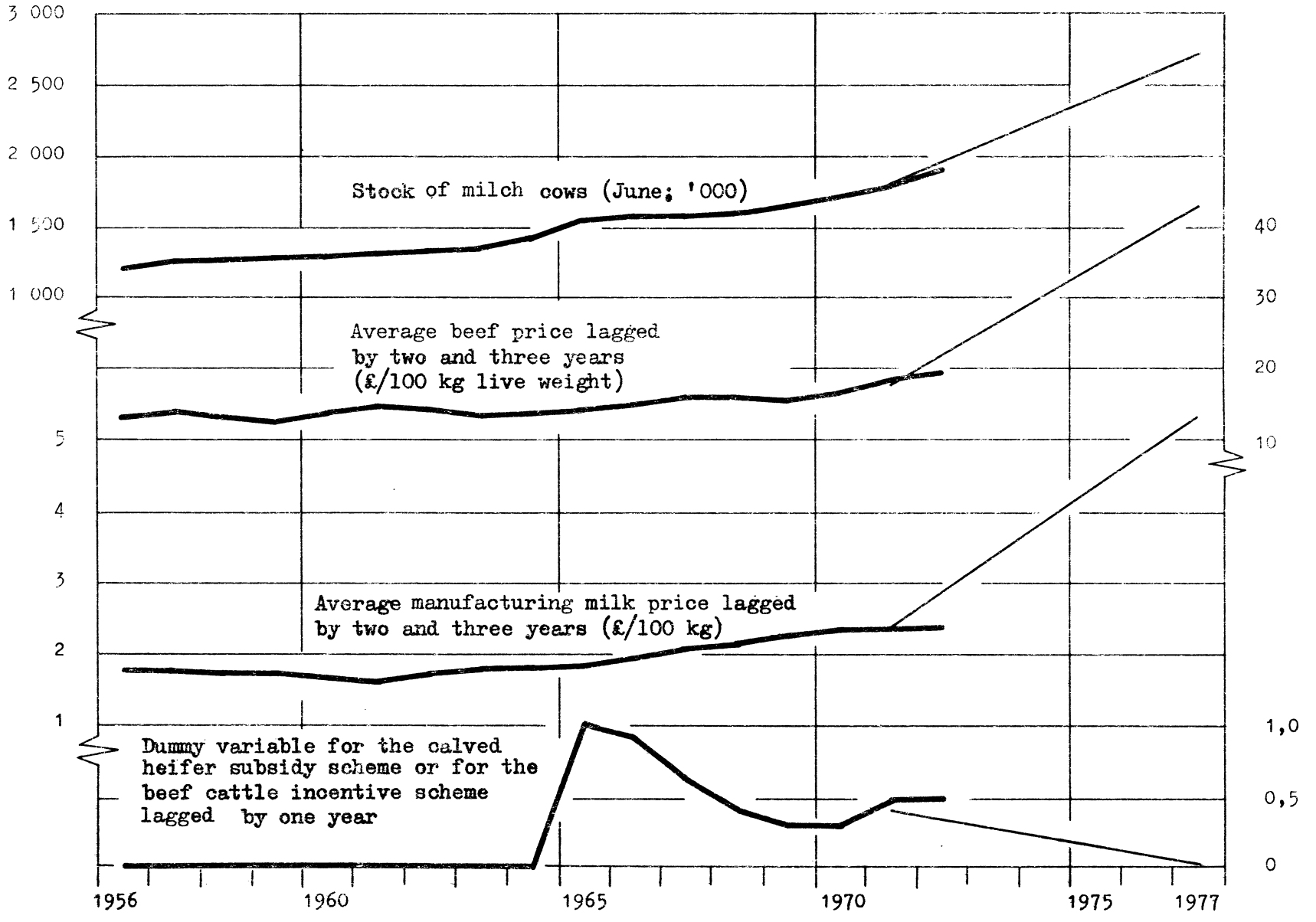
The dummy variable D(c) appearing in the equation for determining

the number of cows is to assume a value of nil in 1977. (The justification for this was given in IV, 1 b). From (25) we then obtain a figure of 3 360 000 cows for 1977 (actually 1979) (1969/71: 1 717 000; increase: 96%). A doubling of the number of cows by 1979 seems to be almost completely ruled out. The reason for this result, which is surprising in view of the good performance of equation (25) in accounting for the number of cows in the period under review, is not difficult to find. According to our hypotheses, the price of milk would rise by 123% from 1967/69 to 1977 and the price of beef by 146%. If the not exactly low elasticity coefficients are taken into account (number of cows in relation to milk price and in relation to beef price: about + 0.4), it becomes clear that the above forecast based on equation (25) reflects in the main only the effects of the rise in the absolute prices of milk and beef. Equation (25) does not include the "level effect" either - in other words, the expected increases, some of them considerable, in the prices of the other important farm products. We must assume the same for dairy and beef farmers as we did for producers of fodder barley. This means that farms keeping beef cattle see the prices of milk and beef not in isolation but against the background of general farm price trends.

In order to take at least some account of the level effect, we shall attempt a second estimate of both beef and milk prices but in doing so shall include in equation (25) only the increase up to 1977 that exceeds the rise in the price of fodder barley (the fodder price was used as a "deflator" for milk and beef prices only by analogy to the corresponding estimate obtained with equation (23)). On this assumption, the figure obtained for 1977 (actually 1979) is a much more realistic one of about 2 300 000 (1969/71: 1 717 000; increase: 34%), which also fits in well with the results of the Irish survey among farmers (according to farmers' plans, the number of cows of all kinds included in the sample is 36% higher for 1975 than for 1970).

The keeping of dairy and beef cows and also store cattle would hardly be affected by the increase in fodder grain prices to be expected under EEC conditions (as a cost factor). Even in the period under review

Diagram 8 - The milch cow stock and its most important determining factors in Ireland 1956-72, 1977



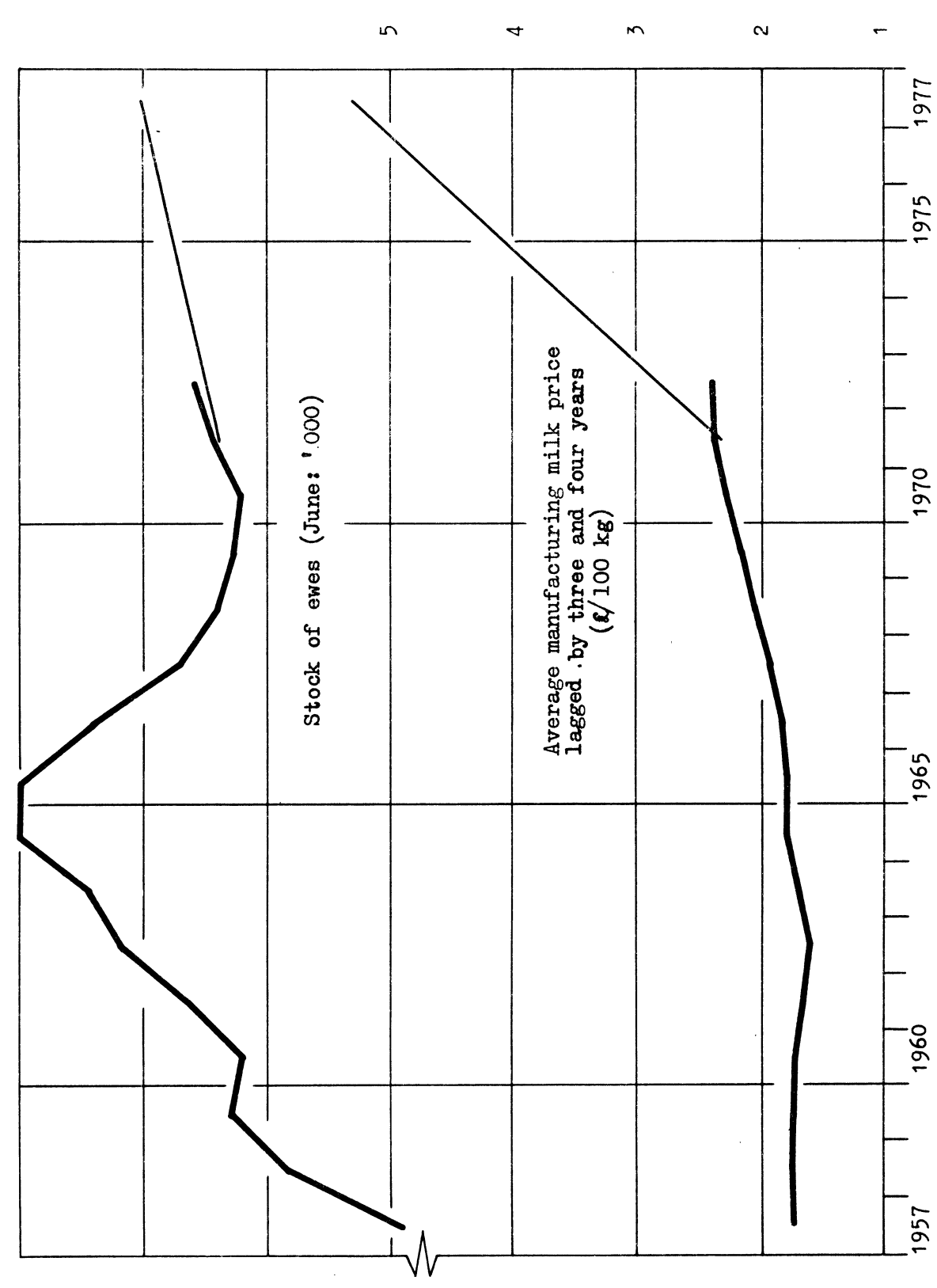
the use of concentrates of all kinds and in particular the use of fodder grain for cattle feeding played only a very minor role. There is nothing to indicate that this will change in the future. It is true that because of the relatively long period of fattening on pastureland Irish cattle may be rather too fat for the current preferences of many consumers in continental Europe (including above all consumers in France and Italy). However, this must be viewed in light of the fact that for health reasons the trend towards the consumption of meat from cattle reared in as natural a manner as possible will probably become more marked in future. Ireland could benefit greatly from this. The intense building up of the cow stock observed in the last two years (+ 4% from June 1970 to June 1971; + 6.3% from June 1971 to June 1972), which probably reflects, above all, a reaction to the price increase on the international markets in milk products in 1970/71 and to extraordinarily marked upward movement in beef prices on the world market, which continued until very recently, also raises the basis of our forecast: compared to the level of about 1 895 000 cows in June 1972, a stock of 2 300 000 in 1977 would represent an increase of only 21%. To avoid the risk of giving too pessimistic an estimate of the possible future growth in the number of cows in Ireland, we shall assume for 1977 (actually 1979) a cow stock of 2 700 000 head (+ 42% up on 1972).

e. Number of ewes

The dummy variable D(s) in equation (26) is given a value of nil for 1977. This implies that under a future assumed EEC organisation of the market in mutton and lamb special encouragement of mountain and hill sheep farming will be possible and will be more or less equivalent to the MLSS or MHES. Equation (26) then gives the number of ewes in 1977 (actually 1980) as being only 820 000 (1969/71: 1 862 000; - 56%). The reason for this is that the very negative milk price effect (expected increase in the milk price from 1967/69 to 1977: 123%; elasticity of the number of ewes in relation to the milk price: - 1.3 !) is compensated to only a very small extent by the positive trend influence. Equation (26) could not take account of the level effect either, i.e. the

price of mutton and lamb, which according to our hypotheses, will rise only slightly less rapidly than the milk price by 1977. The price ratio (milk : mutton and lamb) would, accordingly, increase by 13% between 1967/69 and 1977. If a milk price for 1977 that is 13% higher than in 1967/69 is included in (26), the number of ewes obtained for 1977 is 2 000 000 (+ 7% compared with 1969/71. As regards this estimate, it could be objected that in the review period the "level effect" was of only little scope. The price ratio (milk : mutton and lamb) played no important part in accounting for the number of ewes, while the fluctuations in the milk price alone were the most important factor determining the short and medium-term fluctuations in the number of ewes, even though the price ratio (milk : mutton and lamb) changed substantially. This tends to indicate that on many farms the number of ewes kept will be adapted to the number of cows - meaning that milk and beef were to be considered as priority products. If, consequently, the estimate of a rapid increase in the number of cows is given priority and thus left unchanged, the possibility of an equally rapidly growing stock of ewes can be immediately excluded as being unrealistic because of the grazing capacity and labour factors. The authors of the Irish farmers' survey obtained results which, in principle, were identical to these. The survey showed, in fact, that between 1970 and 1975 the farmers wanted to increase not only the number of cows but also the number of ewes by 35-40%. The authors of the survey are rather sceptical about these intentions as far as the resulting stocking rate is concerned: "The increases in the livestock enterprises are rather large especially in view of the fact that there would be no reduction in tillage acreage. The increased livestock would have to be carried by intensifying the stocking rate. The stocking rate in 1970 was approximately 1.5 forage acres per livestock unit and this would fall to 1.4 acres in 1972 and 1.2 acres in 1975. Such intensification is technically quite feasible but nevertheless one

Diagram 9 - The stock of ewes and the manufacturing milk price in Ireland, 1957-72, 1977



is entitled to suspect that the planned changes indicated by the farmers are somewhat optimistic."[1]

It does not, however, seem very plausible that a rapid increase in the cow stock by 1977 will lead to such a drastic reduction in the number of ewes as equation (26) suggests on the basis of the absolute milk price. To that extent, the stock of ewes (2 000 000) which was calculated for 1977 by means of equation (26), account having been taken of the level effect, and which indicated only a marginal increase compared with 1969/71, might be accepted as a compromise solution. But even this result can, in our view, be valid only if at the same time it is assumed that the somewhat greater expansion of the stock of ewes in hill and mountain areas is accompanied by a marked decrease in the number of ewes in lowland areas.

f. Number of sows

The milk price appears in absolute terms in equation (27) too. Previous experience (fodder barley cultivation, number of cows) leads us to include, when forecasting the number of sows with equation (27), only the rise in the milk price in excess of the increase in the price of fodder barley. Given this, the number of sows for 1977 (actually 1978) is rounded off to 100 000 (1969/71: 136 000; - 27%). The decisive factor here is the price ratio (pigmeat : barley meal), which, according to our price hypotheses, will fall by 14% between 1967/69 and 1977, and which will have a strong influence given an elasticity of the number of sows in relation to this price ratio of + 2.4%. This negative feed cost effect and the milk price effect, which is also negative, will be only partly offset by the positive trend influence, which in the period under review resulted mainly from the greater productivity gains in pig farming than in cattle farming. As no appreciable intensification of dairy and beef production is to be expected in the future, the positive trend effect should continue until 1977.

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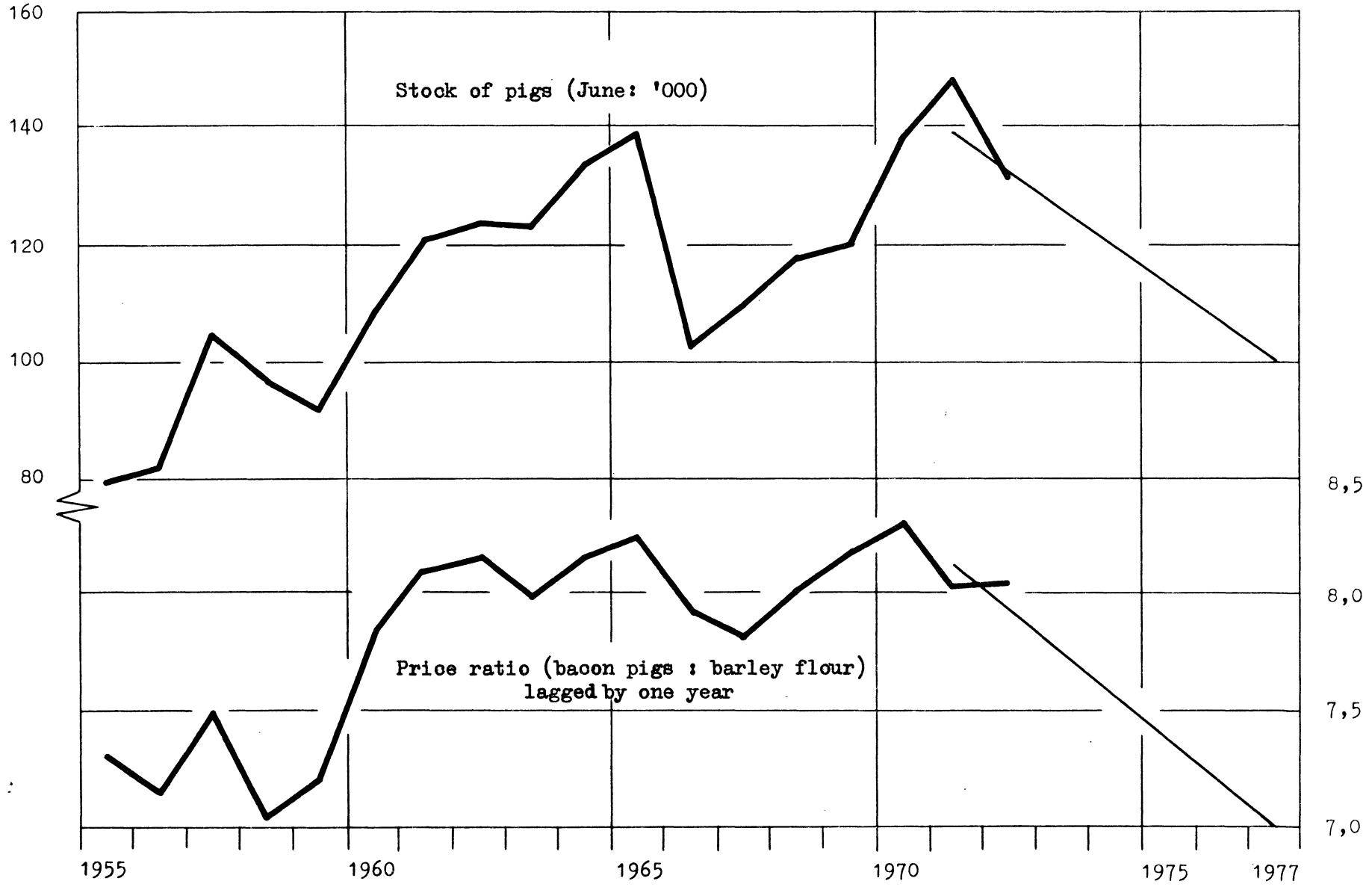
[1] Seamus J. Sheehy and Marcus J. McInerney, op. cit., p. 16.

Diagram 10 - The stock of pigs and the price ratio (bacon pigs : barley flour) in Ireland 1955-72, 1977



g. Number of laying hens

Using equation (28), a 33% fall in the number of laying hens, to 3 400 000, was estimated between 1967/69 and 1977. The reasons for this result are both the negative feed cost effect (48% decline in the price ratio (eggs : layers' mash) from 1967/69 to 1977 , which will, however, have only a limited effect because of the fairly inelastic reaction of egg farmers to this price ratio) and, above all, the trend effect; both these negative effects are offset to only a minor extent by the slightly positive influence of the price ratio (pigmeat : barley meal). The negative trend effect in the period under review reflected the declining demand for eggs on the domestic market and on export markets. Under EEC conditions there is not likely to be much change in this at first since a number of competing EEC countries (United Kingdom, Netherlands) are too far ahead of Ireland as regards efficiency and productivity in egg production. A survey published by the Irish Department of Agriculture on the effects of EEC membership on agriculture offers little prospect for exports of eggs or egg products under EEC conditions for the reasons given above; it appears that it would be considered a success if domestic producers could even retain their share of the domestic market.[1] Under these circumstances, a continuation of the negative trend influence in the forecasting period is almost certain particularly as the demand forecast indicated a further considerable reduction in domestic egg consumption which must, moreover, be seen against the background of an upward trend in laying yields.

2. Forecast of the areas under cultivation and the stocks of products and animals respectively not included in the econometric analysis of supply

a. Barley for malting

According to our hypotheses, the producer price for barley for

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[1] Department of Agriculture and Fisheries, Irish Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970, p. 68 et seq.

malting would rise at a considerably less rapid rate under EEC conditions than the price for fodder barley - this means that the margin between barley for malting and fodder barley, a decisive economic incentive for the production of barley for malting, would decrease (by 54% from 1967/69 to 1977, falling from £0.80 per 100 kg to £0.37 per 100 kg). This, together with the very much stronger competition from cattle farming (pasture land) expected in the future, could prevent a further expansion in the cultivation of barley for malting (assumption for 1977: 50 000 ha; 1969/71: also 50 000 ha). This tallies perfectly with the results of the survey of Irish farmers (from 1970 to 1975 the area under barley for malting should, according to the farmers' plans, remain more or less constant).

b. Oats

The support price system for oats in the western counties will probably have to be abolished after accession to the EEC, since the EEC organization of the market in cereals provides only for indirect support of the price of oats via the intervention arrangements for the other cereals and via the levy system. Nonetheless, much higher producer prices for oats can be expected under EEC conditions (we expect market prices for oats in 1977 to be almost 60% higher than prices in 1967/69). This is hardly sufficient to halt the decline in the cultivation of oats, since the prices for fodder barley - the most important competing cereal - would rise by about 65% in the same period while beef and milk prices would on average rise twice as fast. As regards the utilization of oats, the demand for fodder oats from the feedingstuffs industry, which will probably continue to decline because of the reduction in the number of horses, poultry and, in the future, pigs too, and the decreasing proportion of rolled oats in the total consumption of breakfast cereals as a result of competition from corn flakes, should be mentioned. Consequently, a very much reduced area under oats of 45 000 ha was assumed for 1977, compared with 69 000 ha in 1969/71.

c. Rape

Rape has hitherto not been grown as an oilseed in Ireland - probably

because Irish farmers would have had to be content with a producer price approximately equivalent to the world market price. Under these circumstances, rape as a break crop for grain would not have been economically worthwhile in comparison, for example, with sugar beet, which was bought from farmers by the Irish Sugar Company at comparatively high contractual prices. Under EEC conditions, this is no longer the case, since in the Community the producer price for rapeseed as an oil seed is supported at a level well above world market prices (via an intervention system for rapeseed). Accordingly, the growing of spring and/or winter rape could in future be very attractive for Irish farmers. To take account of this, we have assumed for 1977 an area under rape of 20 000 ha - this is equal to 33% of the estimate of the area under wheat in 1977 and at least 10% of that under fodder barley.

d. Sugar beet

The forecast of the area under sugar beet is based on the assumption that in 1977 in the EEC Ireland will be allocated a white sugar production from beet of 150 000 tons. The beet yield per ha was, at 38.3 tons, not particularly high in the years 1969/71; an appreciable increase by 1977 is, however, rather unlikely since sugar beet growing will be by far the most seriously affected enterprise as a result of the suspension of fertilizer subsidies under EEC conditions[1] (assumption for 1977: 39.0 tons per ha). However, a significant increase in the sugar yield from beet appears possible as a result of technically improved extraction methods and selective cultivation successes (assumption for 1977: 15% of beet weight on delivery; 1968/70: 14.4%; + 4.2%). The white sugar yield per ha would then rise by 5.0% from 5.57 tons (1968/70) to 5.85 tons in 1977. In order to obtain a total white sugar production of 150 000 tons with a white sugar yield of 5.85 tons per ha, 26 000 ha of sugar beet would have to be cultivated in 1977; this beet area would then remain almost unchanged compared with 1968/70, but would fall by 13.3% compared with 1971 (30 000 ha).

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[1] See Seamus J. Sheehy and Marcus J. McInerney, op. cit. p. 11.

e. Fodder beet of all kinds

The cultivation of fodder beet declined sharply in the period under review, mainly for reasons of labour and mechanization (1958/60: 70 000 ha; 1969/71: 51 000 ha; - 27.1%). In Ireland fodder beet is grown mainly in crop rotation with cereals; the beet produced is used primarily as winter fodder for cattle and partly as fodder for pigs. The tendency for the cultivation of fodder beet to decline for reasons of labour and mechanization will most probably continue in the future since under EEC conditions rape could become increasingly important as a particularly labour-saving break crop for cereals (see IV. 2 c). By means of a graphic trend extrapolation, an area under fodder beet of 40 000 ha was forecast for 1977 (21.6% down on 1969/71).

f. Apples

The bulk of the commercial production of apples in Ireland consists of cooking apples[1]; the demand for dessert apples has to be met largely by imports. Under EEC conditions the domestic production of dessert apples is likely to encounter considerable difficulties as a result of the free access enjoyed by Italian and French producers (greatly favoured, in any case, by climatic conditions) to the Irish market. For cooking applies, the United Kingdom will also be a competitor on the domestic market (for example, imports of Bramley seedlings - cooking apples from Northern Ireland). The decline in apple growing in Ireland quickened considerably in the period under review (1959: 3 278 ha; 1965: 2954 ha; - 9.9%; 1970: 2 226 ha; 24.6% down on 1965). By 1977 we expect a further reduction in the area under apple orchards to 1 600 ha (-30%).

g. Tomatoes

In contrast to apple growing, Ireland achieved, in respect of commercial tomato growing under glass, considerable increases in productivity and substantial improvements in the quality of the tomatoes produced

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[1] Department of Agriculture and Fisheries, Irish Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970, p. 86.

and in the organization of marketing in the years after 1960. The increase in exports of fresh tomatoes (mainly to Northern Ireland) from only 400 tons in 1960 to 3 900 tons in 1971 is a clear indication of this. Special mention should be made of the fact that on the UK market the wholesale trade values Irish tomatoes slightly more highly than those from the Netherlands or the Channel Islands[1]. The increasing share of the domestic market going to Irish producers (1960/62: 10 900 tons or 69.3%; 1967/69: 13 800 tons or 79.3%) was probably made possible by the ban on imports during the main harvesting season for domestic tomatoes; as a result, it tells us little about the competitive capacity of domestic producers on their home market. Export successes in the United Kingdom indicate that even under EEC conditions Irish producers of glasshouse tomatoes could still increase their exports substantially. Only their share of the domestic fresh tomato market will probably decline somewhat because of the expected abolition of the seasonal import ban under EEC conditions. Given these on the whole not unfavourable prospects for Irish tomato producers in the EEC we assume that the total production will increase by 47% to 25 000 tons from 1969 to 1977 (70% rise in the period 1960-69).

h. Horses

The downward trend in the stock of horses in Ireland during the period under review (1958: 244 000; 1971: 117 000) may be expected to continue at least in the immediate future. We deduce this from the fact that at present by far the largest proportion of the total stock of horses consists of draught horses (1971: 63.7%), whose number is falling as a result of rapidly growing mechanization even in remote hill and mountain areas. The annual decrease in the number of draught horses is, as a rule, considerably higher than the increase in the number of other horses (particularly saddle horses) so that the total stock is decreasing.

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[1] E.T. Gibbons, M.J. Hankin and F.K. O'Neill, The Irish Tomato Industry, An Foras Talúntais, Dublin, December 1970, p. 40 et seq.

A graphic trend extrapolation gave the number of horses in 1977 as 90 000 (- 23.1% against 1971).

3. Test of the area under cultivation

Unlike in most Western European countries, the agricultural area in Ireland in the period under review tended to increase (1958/59: 4 715 000 ha; 1970/71: 4 811 000 ha; increase: 2.0%). According to official Irish statistics, the agricultural area comprises the area under cultivation plus temporary and permanent grassland, but does not include rough grazings, such as low-yield hill and mountain grazings, heath and moorland which are grazed more or less regularly (mainly by sheep). Rough grazings are included with "other land" (meaning areas not used for agriculture), but the dividing line between rough grazings and permanent grassland is fairly fluid, as can be seen from a comment by the Irish Central Statistics Office on the land use statistics: "It should be recognised, however, that it is impossible to draw a precise distinction on a consistent basis between "rough grazing" which is usually grazed mountain land and good grazing which is included as pasture. The standards adopted no doubt vary between enumerators in different years and in different areas".[1] As the total land area in Ireland remained constant in the period under review, the increase of 96 000 ha in the area used for agriculture from 1958/69 to 1970/71 is accompanied by a corresponding reduction in "other land". This means that the increase in the agricultural area was achieved by converting low-yield rough grazings into higher-yield permanent pasture (subject to the difficulties in distinguishing between permanent pasture and rough grazings mentioned above).

Converted to livestock units (LSU), the number of horses, cattle and sheep in Ireland increased from 4 786 000 (1958/59) to 5 975 000 in

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[1] See Central Statistics Office, "Irish Statistical Bulletin", Dublin, March 1966, p. 58.

Table 15 - Test of the area under cultivation - Ireland

('000 ha)[a]

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971		1977
Total area under cultivation	718	668	677	646	643	611	582	566	511	526	528	513	532	536		468
Cereals - total	481	435	453	435	432	402	388	377	338	355	362	357	377	386		335
Wheat	170	114	148	140	127	94	87	74	53	76	90	82	95	91		60
Barley	126	134	133	146	165	174	184	188	187	183	184	198	214	235		230
Oats	185	187	172	149	140	134	117	115	98	96	88	77	68	60		45
Sugar beet	34	28	28	32	32	36	32	27	22	26	26	25	26	30		26
Potatoes	106	105	95	86	85	83	74	71	68	65	59	55	57	52		35
Peas and beans	1	2	2	2	3	3	3	3	2	2	3	4	4	4		2
Fodder beet of all types[b]	70	70	69	64	65	63	61	64	61	59	59	55	51	47		40
Cabbage[c]	.	.	14	12	12	10	10	9	8	7	6	5	5	.		3
Fruit - total	5	5	4	5	4	4	4	4	3	3	3	3	3	4		2
Other[c]	21	23	12	10	10	10	10	11	9	9	10	9	9	13		25
Total pastureland[e]	3 997	4 046	3 869	3 913	3 973	4 006	4 079	4 145	4 242	4 256	4 274	4 302	4 263	4 291		4 532
Mowing pasture	781	761	802	765	750	776	782	798	817	833	848	891	919	982		1 300
Permanent pasture[e]	3 216	3 285	3 067	3 148	3 223	3 230	3 297	3 347	3 425	3 423	3 426	3 411	3 344	3 309		3 232
Total area used for agriculture[d][e]	4 715	4 714	4 546	4 559	4 616	4 617	4 661	4 711	4 753	4 782	4 802	4 815	4 795	4 827		5 000

[a] June. [b] Turnips, mangels and fodder beet. [c] In 1958, 1959 and 1971 the area under cabbage is included under "other". [d] Excluding rough grazings, which are not recorded separately. [e] The distinction of permanent pasture and rough grazings, which are counted as "other land", differs slightly in 1960-64 from the other years.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Own calculations and estimates.

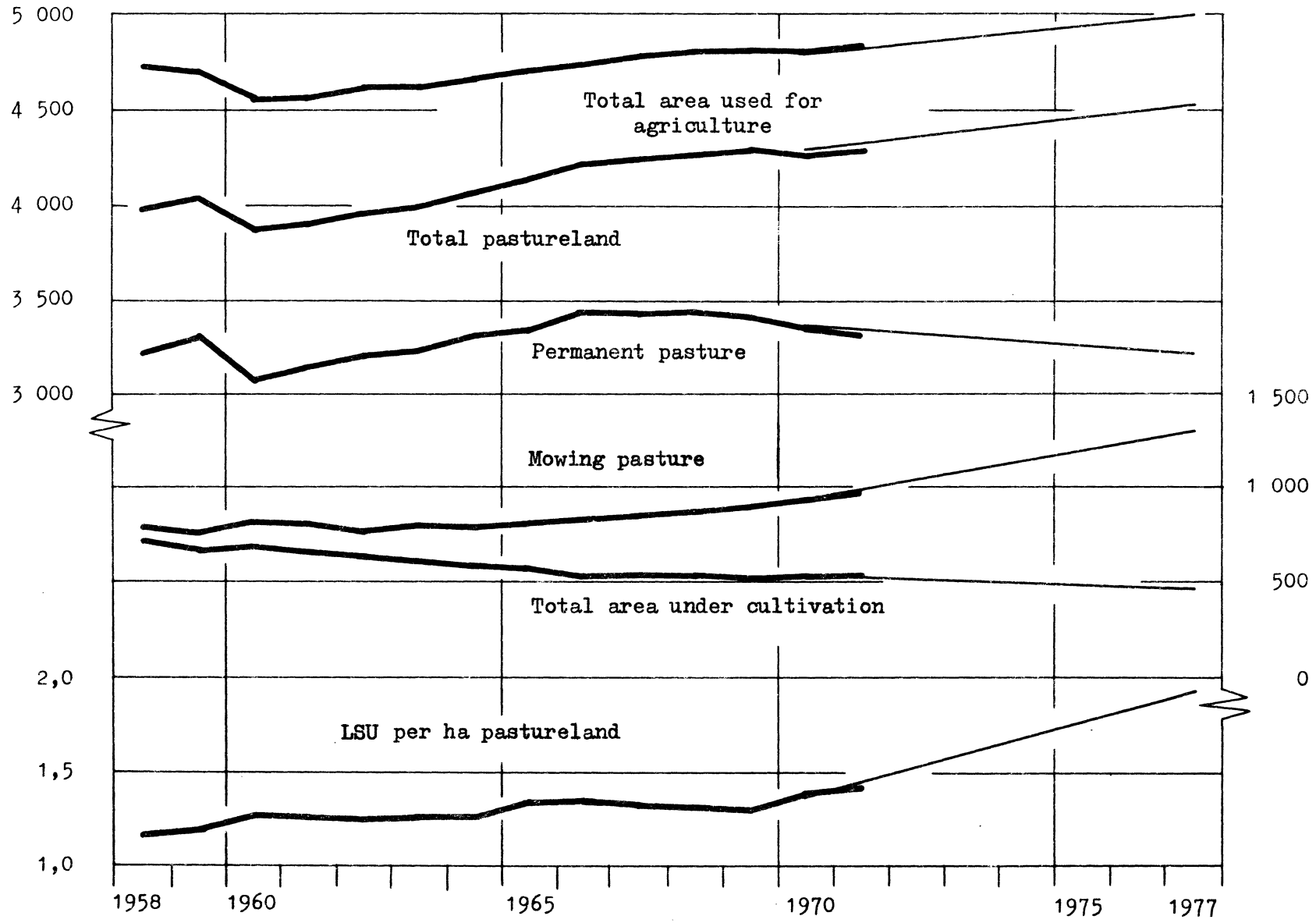
Table 16 - Trend in the stocking rate in Ireland

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971		1977
Number of horses ('000 000)	0 244	0 234	0 224	0 207	0 196	0,190	0 180	0 172	0 158	0 143	0 134	0,125	0 124	0 117		0,090
Number of cattle ('000 000)	4 466	4 684	4 741	4 713	4 742	4 860	4 962	5 359	5 590	5 586	5 572	5 688	5 957	6 134		9 153[c]
Number of sheep ('000 000)	4 174	4 412	4 314	4 528	4 671	4 691	4 950	5 014	4 664	4 239	4 077	4 006	4 082	4 189		4 300[d]
Number of cattle ('000 000 LSU)[a]	4 019	4 216	4 267	4 242	4 268	4 374	4 466	4 823	5 031	5 027	5 015	5 119	5 361	5 521		8 238
Number of sheep ('000 000 LSU)[b]	0 417	0 441	0 431	0 453	0,467	0 469	0 495	0 501	0 466	0,424	0 408	0,401	0 408	0 419		0,430
Total number of horses, cattle & sheep ('000 000 LSU)[e]	4 680	4 891	4 922	4 902	4 931	5 033	5 141	5 496	5 655	5 594	5 557	5 645	5 893	6 057		8 758
LSU per ha pastureland[f]	1 171	1 209	1 272	1 253	1 241	1 256	1 260	1 326	1 333	1 314	1 300	1 312	1 382	1 412		1 932

[a] 1 head of cattle ≈ 0.9 LSU. [b] 1 sheep ≈ 0.1 LSU. [c] Total number of cattle = 3.39 x number of milch cows. [d] Total number of sheep = 2.15 x number of ewes. [e] 1 horse = 1 LSU. [f] Data for 1960-64 are not fully comparable with those for the other years since pastureland was defined somewhat differently in 1960-64 (see footnote (e) in Table 15).

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Own calculations and estimates.

Diagram 11 - Test of the area under cultivation in Ireland



1970/71, a rise of 24.8%. This was predominantly (70%) accounted for by an increase in the stocking rate from 1.190 LSU per ha in 1958/59 to 1.397 LSU per ha in 1970/71, an increase of 17.4% (see also Tables 15 and 16). This rise in the stocking rate was made possible mainly by intensification of grassland use, in which Government incentives played an important part. The subsidies for the use of silage as winter fodder introduced in 1964 and administered by the regional County Committees of Agriculture on behalf of the Department of Agriculture brought about an increase in the production of grass silage from only 434 000 tons in 1963 to 3 537 000 tons in 1970. The area planted with specific high-yield grasses and lucerne as a percentage of the total pasture land increased from 19.2% (771 000 ha) in 1958/59 to 22.2% (951 000 ha) in 1970/71. The use of artificial fertilizers on permanent pasture also brought about some improvements but, on the whole, these remained modest despite the fertilizer subsidies. The substitution of fodder grain and other concentrates for grass in the feeding of grazing stock was of little importance in the period under review; its influence on the stocking rate must have been only marginal. About 30% of the increase in the number of grazing animals (see above) was met by an expansion in grazing land. The total pasture land (permanent and temporary pasture) rose by 6.3% (255 000 ha) from 4 022 000 ha (1958/59) to 4 277 000 ha (1970/71). Of this 159 000 ha came from the reconversion of arable land into permanent pasture and/or the utilization of areas under root crops or cereals as temporary pasture. A further 96 000 ha resulted from the conversion of rough grazings into permament pasture described above.

A sharp increase in the grazing stock to 8 758 000 LSU is estimated by 1977 (actually 1979/80) (+ 44.6% compared with 1971). This should provide a powerful incentive for converting rough grazings into permanent pasture, since, in view of the extraordinarly rapid rise in producer prices for milk, beef, mutton and lamb, the use of labour and capital for this purpose will certainly be much more worthwhile from the micro-economic point of view than in the period under review. The reserve of rough grazings suitable for this purpose appears to be still fairly large, as the following comment by the Department of Agriculture on the Mountain Fencing Scheme shows: "This scheme was introduced in September 1961 with

the object of aiding the improvement of the very large areas of mountain and hill type lands, many of which have a good potential for livestock grazing and which, if developed, could add substantially to the individual and national income with consequent benefit to both"[1] (author's underlinings). On this basis, we assume that from 1971 to 1977 there will be a further increase of 173 000 ha (3.6%) in the area used for agriculture at the expense of rough grazings, thus bringing the total area to 5 000 000 ha. "Other land" would, accordingly, be reduced by 173 000 ha (or by 8.4%) (1971: 2 061 000 ha; 1977: 1 888 000 ha). According to our estimates (see IV. 1 and 2), the total area under cultivation would fall by 68 000 ha from 1971 to 1977 so that in the same period pasture land could increase by a total of 241 000 ha (68 000 + 173 000) to 4 532 000 ha. With the number of horses, cattle and sheep equivalent to 8 758 000 LSU, a stocking rate of 1.932 LSU per ha would be necessary in 1977, an increase of 36.8% compared with 1971 (1.412 LSU per ha). An increase of this size in the stocking rate would probably be possible by substantially increasing, first of all, the hitherto very low amounts of fertilizer applied per ha of pasture. Despite the abolition of the fertilizer subsidies (under EEC conditions), this appears extremely sensible, from the micro-economic viewpoint, especially when one also bears in mind the assumed increase of more than 100% in the producer prices of milk, beef, mutton and lamb from 1967/69 to 1977. In addition to the more intensive use of fertilizers, higher yields per unit pasture area could be obtained during the forecasting period by improved grassland conservation methods and by the conversion of permanent pasture or of land no longer used for root crops and cereals into temporary pasture. (Here it was assumed that the proportion of temporary pasture in total pasture land will increase from 982 000 ha or 22.9% in 1971 to 1 300 000 ha or 28.7% in 1977).

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[1] Annual Report of the Minister for Agriculture and Fisheries 1969-70, Dublin, Stationery Office, p. 88.

4. Forecast of yields per unit area and of livestock yields; comments on the methods used to calculate production

The results of the forecast of yields per unit area and of livestock yields are shown in Table 17. The values given for 1977 were not obtained by mathematical methods, but merely by graphic trend extrapolations - combined with logical considerations. In connection with cereal yields it must be borne in mind that they are based on a moisture content of about 20%, whereas internationally (and also in EEC agricultural statistics) a value of about 15-16% is taken. As regards crop production, a very much slower rate of increase in yields per unit area than that in the period under review was assumed for the forecasting period. This was because of the unavoidable suspension, under EEC conditions, of the very extensive fertilizer subsidies granted in the past and also because of the fact that in future the use of toxic plant protection agents in agriculture in order to reduce environmental pollution will be much more restricted than in the past (see the "United Kingdom" survey for further details on this problem). In forecasting milk yields per cow it was assumed that the use of oilcake in dairy farming would continue to be limited mainly to liquid milk production in areas around Dublin and Cork (no significant increase in the use of oilcake for the production of manufacturing milk) and that the proportion of beef cows in the total number of cows would show a greater increase up to 1977 or 1979 than in the period under review, which, other things being equal, would have a negative effect on milk yields. Unlike crop yields and milk yields, laying yields per hen should increase slightly faster than in the past since, under EEC conditions, an accelerated change-over from free-range egg poultry farming to more industrialised forms of poultry farming will be necessary for domestic producers to remain competitive.

When the areas under cultivation and area yields are known for 1977, crop production for 1977 can be determined simply by multiplying these two values (the same applies to milk and egg production when the number of cows and hens is known). Meat production in 1977 (beef, mutton and

Table 17 - Results of the forecast of yields per unit area in crop production and yields per animal in livestock production in Ireland for 1977

Product	ø 1958/61	ø 1967/70	1977	ø Increase 1958/61 - 1967/70(%)	Average annual growth rate ø 1958/61 to ø 1967/70 (%)	ø Increase 1967/70 - 1977 (%)	Average annual growth rate ø 1967-70 to 1977 (%)
Area yields:							
Wheat (100 kg per ha).	29.6	42.4	45.0	43.2	4.1	6.1	0.7
Barley for malting (100 kg per ha)..	30.8	36.5	40.0	18.5	1.9	9.6	1.0
Fodder barley (100 kg per ha)..	33.2	39.3	42.0	18.4	1.9	6.9	0.7
Oats (100 kg per ha)..	25.2	31.5	35.0	25.0	2.5	11.1	1.2
Potatoes (tons per ha)	21.8	26.7	30.0	22.5	2.3	12.4	1.3
Livestock yields:							
Milk yield per cow(kg)	2 064	2 211	2 300	7.1	0.8	4.0	0.4
Egg yield per hen eggs)...	139	147[a]	157	5.8	0.6	6.8	0.7

[a] 1967/69.

Source: See individual supply situation statements. Own calculations and estimates.

pigmeat) will be determined on the basis of the number of female breeding animals, for which estimates were made in IV.1, and with reference to the models constructed in the analytical part of the survey (see III, 2).

5. Comparison of the results of the forecast of the production and consumption of the individual products

a. Cereals

According to our estimates, Irish cereal production in 1977 will, at 1 384 000 tons, show little change from the years 1968/70 (1 407 000 tons); in 1977 270 000 tons or 19.5% of total production would be accounted for by wheat, 200 000 tons or 14.5% by barley for malting, 756 000 tons or 54.6% by fodder barley and 158 000 tons or 11.4% by oats.

As regards the proportion of millable wheat in the wheat harvest, it is assumed that 1977 will be a year of normal weather conditions and that wheat will only be grown on suitable soil (small area under cultivation); in which case the share of millable wheat in the total amount of wheat sold to the milling industry in 1977 could amount to 90% or 218 000 tons (see Tables 18 and 1*). Assuming that in 1977 external trade in wheat flour and products containing wheat flour will balance (imports = exports = 10 000 tons cereal equivalent), the forecast of demand shows that a flour production of 286 000 tons cereal equivalent will be needed. Theoretically, 76% or 218 000 tons of this can be met by domestic wheat (= total sales of millable wheat by farmers to the milling industry in 1977; see above). Account must, however, be taken of the fact that as from 1973 the Irish milling industry will no longer be subject to the national percentage rules (obligatory use of domestic wheat for blending); it will be completely free to decide where it buys its wheat and in what quantities. In view of consumers' preferences regarding the taste of the bread, the share of domestic wheat in the total quantity milled is, as in the United Kingdom, unlikely to exceed 50%. Accordingly, in 1977 the milling industry will only be able to absorb a maximum of 143 000 tons of domestic wheat; a further 143 000 tons,

Table 18 - Supply of wheat in Ireland Ø 1968/69 - 1970/71 and forecasts for 1977/78

('000 t grain weight - undried)

	Ø1968/69 - 1970/71	1977/78	Percentage change Ø 1968/69-1970/71 to 1977/78	Average annual percentage change Ø 1968/69-1970/71 to 1977/78
Total production	385	270	- 29.9	- 4.3
Use on farms	20	10	- 50.0	- 8.3
Total sales to the milling industry as:	365	260	- 28.8	- 4.2
- millable wheat	343	218	- 36.4	- 5.5
- fodder qualities	0	24	-	-
Proportion of millable wheat in total sales to the milling industry (%)	100.0	90.0	-	-
Imports of bread wheat	140	143	+ 2.1	+ 0.3
Total quantity of wheat milled	334	286	- 14.4	- 1.9
Flour production (product weight)	217	186	- 14.4	- 1.9
Per capita consumption of flour (kg)	77.1	61.0	- 20.9	- 2.9
Total use of domestic wheat as fodder[a]	79	99	+ 25.3	+ 2.9

[a] Fodder qualities and surplus bread wheat (basic period) or denatured wheat (1977/78); excluding fodder used on producer farm.

Source: cf. annexed Table 1*.

of which at least 50% should be high-quality wheat with a high protein and gluten content and also good-quality common wheat, would have to be imported. If the figure of 143 000 tons for flour production is deducted from the total of 218 000 tons of domestic bread wheat which would be on the market in 1977, a quantity of 75 000 tons remains, which, according to EEC regulations would have to be denatured and used as fodder wheat. (The demand for wheat in breweries, distilleries and other industrial undertakings is virtually nil in Ireland). In addition to this there are the 24 000 tons of lower-quality wheat and the estimated 10 000 tons of wheat consumed on farms, so that in 1977 a total of 109 000 tons of wheat (40.4% of the total harvest) would go into the feeding troughs or be exported as fodder wheat.

Irish barley for malting and the malt obtained from it are considered on international markets to be of top quality. It may, therefore, be assumed that malt-houses, breweries and distilleries will continue to cover their barley requirements mainly from contractual domestic cultivation and that the increasing volume of malt exports in the period under review will expand even further under EEC conditions (1969/71: 22 000 tons grain weight; assumption for 1977: 44 000 tons grain weight; see Tables 19 and 2*). In addition, there is likely to be a continuing rapid growth in exports of Irish whisky and a slightly expanding beer output by breweries for both domestic and foreign consumption. Accordingly, we expect a substantially greater total demand for barley for malting from malt-houses, breweries and distilleries in the forecasting period (1977: 195 000 tons; 1967/69:140 000 tons). If the foreseeable seed requirements (about 9 000 tons or 0.170 tons per ha) are deducted from the total production of barley for malting, a total of 191 000 tons remains for sale to malt-houses, breweries and distilleries, which will probably absorb the quantity available immediately (see above); under these conditions, a further 4 000 tons 195 000 - 191 000 would have to be imported as barley for brewing or - and this is more likely - be taken from the domestic supply of fodder barley (top-qualities).

In assessing the harvest of fodder barley in 1977, account must first be taken of seed requirements (30 000 tons or 0.170 tons per ha), the

4 000 tons that should be transferred to the market in barley for malting (see above) and the quantities of (good and top-quality) fodder barley required for the production of "other barley products" (1967/69: 33 000 tons; assumption for 1977: 30 000 tons). In all, 64 000 tons of fodder barley would be required for these purposes so that in 1977 a further 620 000 tons of fodder barley would be available for domestic feeding or for export.

As already stated elsewhere, we expect that in the forecasting period the production of rolled oats (see IV. 2.b. and Table 3*) will at best remain stationary at 15 000 tons grain equivalent per annum, as a result of competition from corn flakes. As before, some of the oats required by the milling industry for flaking are, for reasons of quality, likely to be imported (assumption for 1977: 33% or 5 000 tons) so that Irish farmers could still sell 10 000 tons of oats to the milling industry for food. Given seed requirements of 11 000 tons or 0.240 tons per ha, a total of 137 000 tons (158 000 - 10 000 - 11 000) would be available in 1977 for use as domestic fodder and for export.

The total domestic production of fodder cereals would total 938 000 tons in 1977 (109 000 tons of wheat, 692 000 tons of fodder barley and 137 000 tons of oats). In the years 1967/69 Irish farmers used on average about 1 100 000 tons of fodder grain (including imports). A decline of 14% in the number of pigs and of 32% in the number of laying hens (egg production: - 27%) was forecast for the period from 1967/69 to 1977. Only poultrymeat production was assumed likely to increase substantially (+ 43% from 1967/69 to 1977). As regards pigs it must also be remembered that, according to our estimates, the quantity of fodder potatoes available per pig for slaughter will fall by almost 50% from 1967/69 to 1977 (for further details see IV. 5. c); this could, however, be largely offset by the increased use of feedingstuffs that can be imported free of levies (for example, manioc and tapioca) and, in particular, of animal feed produced domestically (in this connection, mention should be made of the forecast of a very substantial increase in domestic cattle slaughterings; see IV. 5. e). Under these conditions, it is hardly to be

Table 19 - Supply of barley in Ireland Ø 1967/69 to 1969/70 and forecasts for 1977/78

('000t - grain weight)

	Ø 1967/68 to 1969/70	1977/78	Percentage change Ø 1967/68-1969/70 to 1977/78	Average annual percentage change Ø 1967/68-1969/70 to 1977/78
Total production	774	956	+ 23.5	+ 2.4
- Barley for malting	180	200	+ 11.1	+ 1.2
- Fodder barley	594	756	+ 27.3	+ 2.7
Use on farms	204	250	+ 22.5	+ 2.3
Total sales	570	706	+ 23.9	+ 2.4
Malt exports (grain weight)	17	40	+135.3	+ 10.0
Use in malt-houses, breweries and distilleries	140	195	+ 39.3	+ 3.7

Source: cf. annexed Table 2*.

Table 20 - Supply of sugar in Ireland Ø 1968/70 and forecasts for 1977

('000t - white value)

	Ø 1968/70	1977	Percentage change Ø 1968/70 to 1977	Average annual percentage change Ø 1968/70 to 1977
Production	146.0	150.0	+ 2.7	+ 0.3
External trade balance[a]	- 0.2	-25.0	-	-
Total consumption	151.5	175.0	+ 15.5	+ 1.8
- direct consumption	77.5	67.0	- 13.5	- 1.8
- indirect consumption	74.0	108.0	+ 45.9	+ 4.8
Degree of self-sufficiency (%)	96.4	85.7	-	-

[a] Raw sugar, refined sugar and sugar in products containing sugar.

Source: cf. annexed Table 4*

expected that the fodder grain requirements of Irish agriculture will increase appreciably from 1967/69 to 1977. Assuming that the exports of domestic fodder grain remain insignificant in the future, Ireland would in 1977 require an additional 150 000 tons of fodder grain, which, for price reasons and production considerations (e.g. effects of the composition of compound feedingstuffs on meat quality) would probably be covered mainly by fodder maize.

b. Sugar

For 1977 a sugar consumption (direct and indirect) of 175 000 tons white value was forecast so that, with a production quota of 150 000 tons allocated to it, Ireland would have net import requirements of 25 000 tons (see Tables 20 and 4*). It is difficult at present to predict the volume of external trade in sugar in 1977. The Anglo-Irish Sugar Agreement ought to have to be terminated upon the accession of both countries to the EEC. The exports of refined sugar to Northern Ireland would thus no longer be guaranteed. It is still not certain whether the U.S.A. will continue to grant Ireland an import quota for sugar.

c. Potatoes

The 5% fall in domestic ware potato consumption between 1968/70 and 1977 would be accompanied by a much greater reduction in potato production from 1 515 000 to 1 050 000 tons (- 31%) (see Tables 21 and 5*). A substantial rise in exports of potatoes of all kinds from 49 000 tons (1968/70) to 76 000 tons in 1977 is also possible. Exports of (State-tested) seed potatoes, for which, in terms of quality and quantity, Ireland is traditionally one of the leading suppliers on the world markets could increase slightly by 1977 (to 50 000 tons; 1968/70: 40 000 tons). Under EEC conditions, sales prospects for maincrop ware potatoes will improve substantially on the UK market. Import requirements of 570 000 tons of maincrop ware potatoes were estimated for the United Kingdom in 1977. Irish suppliers

Table 21 - Supply of potatoes in Ireland ø 1968/70 and forecasts for 1977

('000 tons)

	ø1968/70	1977	Percentage change ø 1968/70 to 1977	Average annual percentage change ø 1968/70 to 1977
Total production	1 515.0	1 050.0	- 30.7	- 4.5
Fodder on farm	890.0	496.0	- 44.3	- 7.1
Total sales	491.5	473.0	- 3.8	- 0.5
- State-tested seed potatoes	51.1	60.0	+ 17.4	-
- ware and industrial potatoes	440.4	413.0	- 6.2	- 0.8
Total exports	49.2	76.0	+ 54.5	+ 5.6
- State-tested seed potatoes	43.7	50.0	+ 14.4	+ 1.7
- early potatoes	1.4	1.0	-	-
- maincrop ware potatoes	4.1	25.0	-	-
Total imports	3.3	0	-	-
Net exports	45.9	76.0	+ 65.6	+ 6.5
Consumption of ware potatoes	407.7	387.0	- 5.1	- 0.7

Source: cf. annexed Table 5*.

should not find it too difficult to provide about 25 000 tons of this total. Exports of early potatoes will probably still be of minor importance in view of the later delivery dates of Irish potatoes compared with potatoes from the Mediterranean countries and France. If it is assumed that imports of potatoes of all types will be insignificant in 1977, there would still be about 496 000 tons of fodder potatoes available (1968/70: 890 000 tons; - 44%) after deduction of export requirements, the domestic consumption of ware potatoes and the domestic requirements of seed potatoes

d. Rapeseed oil, sunflower oil and olive oil

Assuming for a rape yield of 2 500 kg per ha[1] - and this is purely hypothetical as we have no figures on past trends to go by - an area of 20 000 ha under rape in 1977 would produce 50 000 tons of rapeseed. Given a crude oil extraction rate of 40%, this corresponds to a rapeseed oil production of 20 000 tons. For 1977 a margarine consumption of 150 000 tons (about 13 000 tons crude oil equivalent) was forecast; domestic consumption of manufactured edible fat (compound cooking fat), which rose from 2 100 tons in 1958/60 to 3 600 tons in 1967/69, could be about 5 000 tons in 1977. No statistical data are available on the direct consumption of edible oils; it may, however, be assumed that this also amounts to at least 5 000 tons per annum. Theoretically, it would be possible to cover the entire oil requirements of the margarine and manufactured edible fat industry (18 000 tons in 1977) by the domestic production of rapeseed oil and still to leave a surplus of 2 000 tons, which could either be exported or consumed directly as edible oil. As regards taste, especially that of margarine, we consider, however, that a proportion of more than 50% rapeseed oil in margarine and manufactured edible fats would hardly be practicable and so a realistic assumption is that in 1977 a maximum of 6 500 tons of domestic rapeseed oil will be used in the production of margarine and a maximum of 2 500 tons in the production of manufactured edible fats.[2] Setting aside a further 2 000 tons for

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[1] Net yield per ha, i.e. after deduction of seed requirements for the following farm year.

[2] This applies only if in 1977 in Ireland almost all the rape grown has a low acid content (as in Canada, for example).

edible oil production and for technical purposes, we obtain for 1977 a total domestic demand of 11 000 tons of rapeseed oil (55% of domestic production); the remaining 9 000 tons (22 500 tons of seed) would have to be exported. Imports of rapeseed oil, which totalled 1 400 tons in 1968/70, would probably be insignificant in 1977 compared with domestic production surpluses. In addition, it is probable that domestic rapeseed oil will largely replace imported sunflower oil (1968/70: 1 400 tons; assumption for 1977: 500 tons). Imports of olive oil, which are used almost exclusively for a specific purpose (1968/70: 88 tons), are unlikely to vary much in the future (assumption for 1977: 100 tons).

e. Beef

Given a stock of 2 700 000 cows, the model for cattle utilization gives a gross domestic beef production in 1977 of 493 000 tons (1968/70: 291 000 tons; + 69%; see Tables 22 and 6*). Since a slightly lower domestic consumption of beef than in the base period was forecast for 1977 in view of the sharp price increases, the substantial increase in gross domestic production can go entirely towards improving export potential. With an export surplus of at least 440 000 tons slaughter weight in 1977 (1968/70: 238 000 tons slaughter weight), Ireland would probably become the third largest exporter of cattle and beef (after Argentina and Australia) and would certainly be the country with by far the largest beef surplus within the enlarged EEC. The marketing of live cattle, which predominated in the period under review, should under EEC conditions be considerably restricted in favour of the marketing of dead cattle - a process that will certainly be very much welcomed by the Irish Government on economic grounds (provision of additional jobs in the export slaughterhouses). It was assumed that the meat equivalent of live cattle exports of 117 000 tons (1969/71), would drop to 63 000 tons in 1977 (this figure comprises 180 000 store cattle for the UK market and 100 000 fat cattle for continental European markets). Under these conditions[1], 385 000 tons of beef (fresh, chilled, frozen or preserved) could be exported in 1977 (1969/71: 161 000 tons).

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[1] Total exports of cows for slaughter, bulls for service and calves in 1977 are estimated at less than 1 000 head and may, therefore, be disregarded in the meat position statement; the same applies to imports of store and fat cattle.

Table 22 - Supply of beef in Ireland Ø 1968/70 and forecasts for 1977

('000 tons slaughter weight)

	Ø1968/70	1977	Percentage change Ø 1968/70 to 1977	Average annual percentage change Ø 1968/70 to 1977
Gross domestic production	291.4	493.0	+ 69.2	+ 6.8
Meat equivalent of exports of live cattle	117.7	63.1	- 46.4	- 7.5
Net domestic production	173.7	429.9	+147.5	+ 12.0
Meat equivalent of imports of live cattle	30.7	7.0	- 77.2	- 16.9
Net production	204.4	436.9	+113.7	+ 10.0
Total exports of beef[a]	150.5	385.1	+155.9	+ 12.5
Total export surplus[b]	237.5	441.2	+ 85.8	+ 9.1
Consumption	53.9	51.8	- 3.9	- 0.5

[a] Fresh, chilled, frozen and preserved. [b] Live cattle and meat.

Source: cf. annexed Table 6*.

Table 23 - Supply of mutton and lamb in Ireland Ø 1968/70 and forecasts for 1977

('000 tons slaughter weight)

	Ø1968/70	1977	Percentage change Ø 1968/70 to 1977	Average annual percentage change Ø 1968/70 to 1977
Gross domestic production	41.5	42.2	+ 1.7	+ 0.2
Total export surplus	9.6	10.5	+ 9.4	+ 1.1
Consumption	31.9	31.7	- 0.6	- 0.1
Degree of self-sufficiency (%)	130.1	133.1	-	-

[a] Live sheep and meat.

Source: cf. annexed Table 7*.

f. Mutton and lamb

With 2 000 000 ewes the gross domestic production of mutton and lamb in 1977 would remain unchanged compared with 1968-70 (about 42 000 tons each year; see Tables 23 and 7*); the same applies to domestic consumption (restricted by the expected price rises) and thus also to the overall export surplus (10 000 tons slaughter weight). Unlike cattle, live marketing of sheep might become slightly more important in the future. It was assumed that in 1977 150 000 unfattened sheep (meat equivalent: 3 000 tons) would be exported to the United Kingdom and that 200 000 sheep of all types (meat equivalent: 4 000 tons) would be imported from Great Britain and, above all, Northern Ireland. This considerable increase in foreign trade in live sheep is based solely on the forecast of a rapid expansion of sheep farming in the United Kingdom by 1977 (even in the past the extent of the trade in live sheep between Ireland and the United Kingdom was essentially determined by changes in the total number of sheep in the United Kingdom).

g. Horseflesh

If one assumes that the turnover rate in the stock of horses in Ireland will be approximately as high in 1977 as the average for the years 1964-69 (about 7.5% - see Table 9), then given a stock of 90 000 horses in 1977 barely 6 800 horses would be available for slaughter and given a slaughter weight of 300 kg would provide 2 040 metric tons of fleshmeat. Since it is also hardly to be expected that there will be a domestic demand for horseflesh, the entire domestic production would have to be exported to the countries of continental Europe as was the case in the reference period. It should not be difficult to sell at least 2 000 metric tons of horseflesh in France, Belgium and Italy.

h. Pork and bacon

Given a stock of 100 000 sows and an average of 16 pigs for slaughter per sow per annum, 1 600 000 pigs will be available for slaughter in 1977. Converted to slaughter weight, this represents 112 000 tons (1968/70: 135 000 tons; - 17%; see Tables 24 and 8*). Since, under EEC conditions, bacon and pork will become much cheaper on the domestic market than beef and mutton, a substantial increase in the demand for bacon and pork was forecast (1977: 105 000 tons; 1968/70: 81 000 tons; + 30%). This would leave an export surplus of only 7 000 tons in 1977 (1968/70: 55 000 tons). In view of this rather tight market supply compared with the period under review it cannot be ruled out that in future both bacon and pork will be imported (assumption for 1977: 4 000 tons of pork and 3 000 tons of bacon). Under these conditions a total of 14 000 tons could be exported in 1977 (probably mainly in the form of bacon to the United Kingdom, so that the considerable volume of expenditure by the Irish bacon industry on committing itself to the UK bacon market should not prove unprofitable or pointless in a few years' time). The total production of the Irish bacon industry would have to be appreciably cut back despite the rapidly growing quantities sold on the domestic market compared with 1968/70 (1977: 87 000 tons; 1968/70: 100 000 tons); the same applies to the production of pork, sausages and similar pigmeat products (1968/70: 35 000 tons; 1977: 25 000 tons). The bacon industry, which was seriously worried about the problem of surplus capacity in the period under review, will be faced with almost insoluble tasks as a result of this development - if the idea of a radical contraction and rationalization after Ireland's accession to the EEC is rejected. It is, however, possible that, after certain adaptations have been made to its production structure, the bacon industry will become involved in the processing of the rapidly increasing number of cattle for slaughter in order to make better use of its capacity (in the past similar efforts were made in respect of the slaughter of sheep and lambs).

Table 24 - Supply of pork and bacon in Ireland ø 1968/70 and forecasts for 1977

('000 tons slaughter weight)

	ø1968/70	1977	Percentage change ø 1968/70 to 1977	Average annual percentage change ø 1968/70 to 1977
Total net production[a]	135.4	112.0	- 17.3	- 2.4
- bacon[a]	100.1	87.4	- 12.7	- 1.7
- pork	35.3	24.6	- 30.3	- 4.4
Total exports	54.7	14.2	- 74.0	- 15.5
- bacon[b]	38.5	10.0	- 74.0	- 15.5
- pork[c]	16.2	4.2	- 74.0	- 15.5
Total imports	-	7.0	-	-
- bacon	-	3.0	-	-
- pork	-	4.0	-	-
Total net exports	54.7	7.2	- 86.8	- 22.4
Total consumption	80.7	104.8	+ 29.9	+ 3.3
- bacon	61.6	80.4	+ 30.5	+ 3.4
- pork	19.1	24.4	+ 27.7	+ 3.1
Degree of self-sufficiency (%)	167.8	106.9	-	-

[a] Corresponds essentially to gross domestic production since foreign trade in live pigs is insignificant.

[b] Including tinned ham.

[c] Including pork sausages.

Source: cf. annexed Table 8*.

i. Edible offals

Assuming that the edible offals obtained from the slaughter of cattle accounts for 12% of the net production of beef and veal (pigs: 11%; sheep: 15%), the total production of offals for 1977 is 71 000 tons (1968/70: 46 000 tons; + 54%). The domestic demand would, according to our estimates, increase only marginally in view of the considerable real price rises for ox and sheep's liver (which account for the bulk of offal consumption) so that the sharp rise in domestic consumption will be reflected almost exclusively in an expansion of the export surplus (1969/71: 12 000 tons; 1977: 35 000 tons; see Table 9*).

j. Milk and milk products

Given a stock of 2 700 000 cows and a milk yield of 2 300 kg, total milk production in 1977 will be 6 210 000 tons (1969/71: 3 690 000 tons; + 68%, see Tables 25 and 10*). The use of whole milk as fodder in the period under review evolved in direct proportion to the number of cows; this hardly agrees with the facts, but was merely due to the practice of the Central Statistics Office in always taking the same approximate value of 327 kg for the amount of whole milk fed to each cow each year. In future we expect a marked rise in the proportion of beef cows in the total cow stock and, other things being equal, this will lead to an increase in the average amount of whole milk fed to each cow (all breeds). Accordingly, for 1977 we have assumed a sizeable increase in the amount of whole milk fed to each cow (335 kg). The production of farm butter would be insignificant in 1977, as has already been mentioned in the demand forecast. Under these conditions, the consumption of whole milk by the producing farms (excluding liquid milk and fresh cream) would be 905 000 tons in 1977 (1969/71: 627 000 tons; + 44%). After subtraction of this figure, 5 305 000 tons or 85.4% of total milk production will be available for sale to dairies (including fresh consumption by producers) and to other milk-processing undertakings (1969/71: 83.0%).

Table 25 - Production and use of whole milk in Ireland ø 1969/71 and forecasts for 1977

('000 tons)

	ø1969/71	1977	Percentage change ø 1969/71 to 1977	Average annual percentage change ø 1969/71 to 1977
Total production	3 692	6 210	+ 68.2	+ 7.7
Own consumption by producers	627	905	+ 44.3	+ 5.4
Total sales	3 065	5 305	+ 73.1	+ 8.2
- liquid milk	626	624	- 0.3	- 0.0
- butter	1 724	3 650	+111.7	+ 11.3
- cheese	298	475	+ 59.4	+ 6.9
- whole milk powder	125	235	+ 88.0	+ 9.4
- chocolate crumb	139	133	- 4.3	- 0.6
- other[a]	153	188	+ 22.9	+ 3.0
Proportion of milk used in the production of butter in total milk sales (%)	56.2	68.8	-	-

[a] Yoghourt, milk drinks, ice cream, cream of all kinds, condensed milk.

Source: cf. annexed Table 10*.

Milk supplies are used predominantly for the production of drinking liquid and fresh cream for domestic consumption; the demand forecast gives a figure of 642 000 (624 000 + 18 000) tons of whole milk for these two items. In the "United Kingdom" survey it was assumed that the United Kingdom would not import any more fresh cream from Ireland in 1977. For British imports of tinned cream we obtained an estimate of 10 000 tons product weight, of which Ireland and Denmark could each account for 50%. Converted to whole milk equivalent, 35 000 tons of milk would be required in 1977 for the production of tinned cream for export. Exports of "other cream" (see Table 15*) probably consist mainly of frozen cream supplied to the U.S.A. (ice-cream manufacture). As the U.S.A. have imposed fairly tight quotas on cream imports because of the risk that they might endanger the national support programme for butter fat, cream exports can hardly be expected to increase in future (assumption for 1977: 20 000 tons whole milk equivalent; 1969/71: 21 000 tons).

A substantial rise to 7 600 tons product weight was forecast for the domestic consumption of whole milk powder in 1977. After accession to the EEC, exports could also increase sharply (1969/71: 12 100 tons product weight; estimate for 1977: 20 000 tons) both to the markets of some other EEC countries (no longer any disadvantage resulting from the levies on imports from non-member countries, which in the period under review prevented any substantial deliveries to the Community) and, above all, to developing countries in particular (South-East Asia and Latin America; possibility of claiming export refunds). If it is further assumed that imports of whole milk powder will continue to be insignificant domestic production will have to total 27 600 tons product weight, 235 000 tons whole milk equivalent in 1977 (1968/70: 14 800 tons product weight; see Table 13*).

According to our estimates, the domestic consumption of chocolate crumb would total 18 300 tons in 1977. In the "United Kingdom" survey it was assumed that the UK chocolate and confectionery industry would still have 30 000 tons of chocolate crumb produced by its Irish subsidiaries in 1977. Exports to other countries - primarily the U.S.A. and Canada - are more likely to decline in the forecasting period (assumption

for 1977: 1 000 tons; again the primary factor is the imposition of export quotas by the U.S.A.). To cover the domestic market and export needs a total of 49 300 tons product weight will have to be produced in 1977; this corresponds to a whole milk equivalent of 133 000 tons (see Table 14*).

The processing of whole milk into ice cream, yoghourt and milk drinks for the domestic market and into condensed milk for export was recorded in Table 10* under the collective heading "other". Until 1965 this sector was only of marginal importance as regards the utilization of manufacturing milk (less than 10 000 tons per annum). Since 1966 the domestic market for so-called soft products (yoghourt, ice cream, etc.) appears to have expanded very rapidly; at the same time condensed milk was produced in larger quantities for export (total whole milk equivalent of "other" for 1969/71: 55 000 tons). The markets for ice cream and yoghourt should be capable of further considerable expansion. In the case of condensed milk, the existing complete dependence on the UK market could be reduced by tapping new markets in continental Europe (especially Greece and Italy) and in Africa (for example, Nigeria); the prospects for achieving this are substantially improved by the possibility of claiming export refunds from the EEC farm fund. The production of condensed milk (almost entirely for export) amounted to 1 800 metric tons production weight in the years 1958-60; by 1968/70 it had risen to 2 700 metric tons. We are assuming that production in 1977 (once again entirely for export) will amount to 20 000 metric tons product weight (approximately 50 000 metric tons whole milk equivalent). For the reason given above we have forecast an increase in the amount of whole milk used in the production of ice cream, yoghourt and milk drinks from 43 000 metric tons (1968/70) to 65 000 metric tons in 1977.

Domestic consumption of <u>cheese</u> was estimated at 7 600 tons; export prospects will, therefore, be vital in determining the volume of cheese production in 1977. The most important customer for Irish cheddar will probably continue to be the United Kingdom, whose imports would decline, according to our estimates, from 160 000 tons (1969/71)

Table 26 - Supply of butter and cheese in Ireland ø 1968/70 and forecasts for 1977

('000 tons)

	ø1968/70	1977	Percentage change ø 1968/70 to 1977	Average annual percentage change ø 1968/70 to 1977
BUTTER				
Production[a]	76.2	155.0	+ 103.4	+ 9.3
Export surplus	42.0	124.5	+ 196.4	+ 14.5
Consumption	37.0	30.5	- 17.6	- 2.4
Degree of self-sufficiency (%)	205.9	508.2	-	-
CHEESE				
Production	27.7	46.6	+ 68.2	+ 6.7
Export surplus	21.6	39.0	+ 80.6	+ 7.7
Consumption	6.5	7.6	+ 16.9	+ 2.0
Degree of self-sufficiency (%)	426.2	613.2	-	-

[a]Including farm butter.

Source: cf. annexed Tables 11* and 12*.

to 85 000 tons in 1977. The largest foreign supplier of cheddar to the United Kingdom in the period under review was New Zealand, which has been granted the facility of exporting to the United Kingdom a quota of 15 500 metric tons free from the usual levies on exports from non-member countries[1]. All additional quantities supplied to the United Kingdom by New Zealand in 1977 and all quantities from Australia and Canada would be subject to the EEC levy rules for milk products. Apart from the levy-free quota for New Zealand, this means that cheddar exporters in the enlarged Community will no longer face any significant price competition from the above countries in 1977. The main cheddar exporters of the enlarged Community would be Ireland, the Netherlands and France. There can be hardly any doubt that, as regards quality and advertising on the UK market, Irish suppliers are at present still far superior to their Dutch and French rivals. Possibily the latter will succeed in making up much of this leeway by 1977. Even then it ought to be reasonable to assume that under EEC conditions Ireland's share in UK cheese imports will rise from 13% or 21 000 tons in 1969/71 to at least 40% or 34 000 tons in 1977. A further 6 000 tons of cheddar and other types of cheese could, for example, be marketed in Belgium, Germany, Italy and the U.S.A., giving total cheese exports of 40 000 tons in 1977 (1969/71: 24 000 tons). Imports of cheese in the period under review were limited to small quantities of foreign specialities; no licences were granted for imports of cheddar or any of the other types of cheese produced in Ireland in order to protect domestic suppliers. Under EEC conditions, this restriction would have to be abolished and this would presumably lead to a substantial increase in imports (1969/71: 330 tons; assumption for 1977: 1 000 tons; share of the domestic market accounted for by cheese of foreign origin 13% in 1977 against 6% in 1968/70). Under these conditions, barely 47 000 tons of cheese of all kinds would be produced in Ireland in 1977 (1969/71: 29 000 tons; + 62%; see Tables 26 and 12*), for which 475 000 tons of whole milk would be needed.

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[1] Commonwealth Secretariat, Meat and Dairy Produce Bulletin, Vol. XXV, No. 2, London, February 1972, p. 139.

There remain a further 3 650 000 tons, which would have to be processed into butter in dairies in 1977; this corresponds to a butter production in fresh weight of 155 000 tons (1969/71: 73 000 tons; + 112%; see Tables 26 and 11*). The share of manufacturing milk processed into butter in total milk supplies would, therefore, show a very sharp increase from 56% (1969/71) to 69% in 1977. For butter consumption we obtained an estimate of 30 500 tons; this would leave 124 500 tons available for export in 1977. It is doubtful to say the least whether this amount can be exported. According to our estimates, the United Kingdom would still have to import a total of 268 000 tons of butter in 1977. Of this total 140 000 tons should be supplied by New Zealand, which, as in the case of chedder, was in recent years granted a quota free from the usual non-member levies for exports to the United Kingdom equal to about 80% of its supplies[1]. For the remaining 128 000 tons Irish suppliers would have to compete with Danish, Dutch and French suppliers so that it is hardly to be expected that Ireland will be able to sell much more than 50 000 tons of butter on the UK market in 1977. The other 74 500 tons comprising the Irish butter surplus would have to be sold to other Community countries and to non-member countries. In view of the limited absorptive capacity of these markets we consider this an almost impossible task. There is, therefore, a danger that in 1977 a considerable quantity of surplus butter in Ireland would, under EEC conditions, have to be bought into intervention.

The amount of skimmed milk obtained from butter and cream production in 1977 is calculated at 3 165 000 tons (1969/71: 1 611 000 tons; see Table 16*). The amount of skimmed milk fed to pigs and calves will probably increase only slightly, as the number of pigs is expected to decrease and as pigs receive by far the largest proportion of the total amount of skimmed milk fed to animals (1968/70: 1 173 000 tons; assumption

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[1] Commonwealth Secretariat, Meat and Dairy Produce Bulletin, Vol. XXV., No. 2, London, February 1972, p. 139.

for 1977: 1 300 000 tons; + 11%). After deduction of the amount used for feed purposes and the fresh consumption of skimmed milk, which will probably show little change from previous years during the forecasting period, there remains another 1 805 000 tons, which would have to be processed into powder or casein. Until 1971 no casein was produced in Ireland; in 1972, however, the first casein factory began operation with an annual capacity of 3 500 tons of casein for alimentary purposes (an estimated 116 000 tons of skimmed milk equivalent); it was set up chiefly on the initiative of an American company interested in importing casein for human consumption. Since the long-term sales prospects for casein in the food industry in the United States and in a number of other Western industrial countries can be considered extremely favourable, we assume that the capacity of the casein factory mentioned above will be expanded considerably in the years to come so that in 1977, for example, 200 000 tons of skimmed milk can be processed into casein for food production (corresponding to at least 6 000 tons of casein). Furthermore, 1 605 000 tons of skimmed milk will be available for the production of skimmed milk powder. In 1969/71 the skimmed milk equivalent of dried skimmed milk production was 460 000 tons. There is much to indicate that drying capacities were not, therefore, fully utilized so that a total output of between 800 000 and 1 000 000 tons of skimmed milk would be possible with the existing plant. However, a volume of 1 600 000 tons of skimmed milk could probably not be handled with the existing drying capacity. To achieve this, the drying capacity would have to be expanded considerably by 1977. If this were possible, then in 1977 140 000 tons of skimmed milk powder could be produced (see Table 13*). The domestic consumption of dried skimmed milk in 1968/70 was 8 800 tons, which consisted mainly of skimmed milk powder for feed purposes. It is conceivable that by 1977 there will be a strong increase in the demand for skimmed milk powder both in the feedingstuffs industry and in the food industry (increase in production of preserved meat containing milk protein as a result of the sharp rise in the number of beef cattle for slaughter in

Ireland (assumption: 17 000 tons). In 1977 123 000 tons of skimmed milk powder would thus be available for export, and there should be no great difficulty in marketing it. Possible customers include the feedingstuffs industry in the Netherlands and in Italy and also a number of developing countries in South-East Asia and Latin America. In this connection, mention should be made of the fact that in the late 'sixties the Irish Milk Marketing Board ("An Bord Bainne") was already exploring the possibility of long-term participation by Irish butteroil and dried skimmed milk producers in the supply of raw materials to the recombined milk industry in a number of developing countries (for example, via equity investment).

k. Eggs and poultrymeat

The substantial deterioration from the producers' angle in the price ratio (eggs/poultrymeat : fodder grain) that is to be expected under EEC conditions, together with the obvious leeway the Irish poultry industry has to make up in the way of efficiency and productivity compared with important rivals (United Kingdom, Denmark, Netherlands, Germany and others) would, according to our estimates, mean than in 1977 the share of the market in eggs and poultrymeat enjoyed by Irish suppliers would have fallen considerably in favour of foreign suppliers.

Given a laying hen stock of 3 400 000 and a laying yield of 157 eggs, a total of 44 480 000 dozen hen eggs could be produced in 1977 (1969/71: 60 850 000 dozen; - 27%; see Tables 27 and 17*). If wastage by the distributive trade and processers and also hatching egg requirements are estimated at 3.38% of total production, 42 980 000 dozen hen eggs remain for human consumption. Taking the sale of duck eggs for human consumption to be 500 000 dozen (1969/71: 670 000 dozen; -25%), then in 1977 a total of 43 480 000 dozen eggs would be available from domestic sources for human consumption, with estimated consumption (direct and indirect) totalling 49 990 000 dozen.

Table 27 - Supply of eggs and poultrymeat in Ireland ø 1967/69 and forecasts for 1977

	ø1968/70	1977	Percentage change ø 1968/70 to 1977 (Mill. dozens)	Average annual percentage change ø 1968/70 to 1977
EGGS				
Total sales of eggs for human consumption	59.41	43.48	- 26.8	- 3.8
- hen eggs	58.66	42.98	- 26.7	- 3.8
- duck eggs	0.75	0.50	- 33.3	-
Total external trade balance[a]	- 0.72	- 6.51	-	-
Total consumption	60.13	49.99	- 16.9	- 2.3
- direct	54.35	43.65	- 19.7	- 2.7
- indirect	5.78	6.34	+ 9.7	+ 1.2
Degree of self-sufficiency (%)	98.8	87.0	-	-
			('000 t)	
POULTRYMEAT				
Production	29.6	40.0	+ 35.1	+ 3.8
External trade balance	+ 0.5	- 2.3	-	-
Consumption	29.1	42.3	+ 45.4	+ 4.8
Degree of self-sufficiency (%)	101.7	94.6	-	-

[a] Eggs in shell and egg products in shell egg equivalents.

Source: cf. annexed Tables 17* and 18*.

Accordingly, a net total of 6 510 000 dozen eggs would have to be imported in 1977 (1968/70: 720 000 dozen); since there are unlikely to be any sizeable exports of eggs or egg products in the future, that figure would correspond approximately to the level of gross import requirements.

For the above reasons, Ireland could become a net importer of poultrymeat (1977: 2 300 tons, see Tables 27 and 18*) instead of a net exporter (1968/70: 500 tons).

1. Apples, pears and tomatoes

Given the pressure of a supply of better-quality dessert apples, probably cheaper than home-grown apples, from several other EEC countries (Italy, France), domestic demand for dessert apples in 1977 will probably be almost entirely met by imports; however, it is also possible that cooking apples will be imported (see IV, 2 f). A fall of 40% in domestic production and a rise of 25% in domestic consumption between 1967/69 and 1977 are forecast; in view of this divergent trend in consumption and production the net import requirements for dessert and cooking apples could approximately double by 1977 (see Tables 28 and 19*).

Commercial production of dessert and cooking pears is insignificant in Ireland; under EEC conditions this is unlikely to change. Imports of dessert and cooking pears, which, therefore, represent total domestic demand, increased from 3 300 tons (1958/60) to 4 800 tons in 1969/71 (+ 45%). For 1977 a total consumption or import of about 6 00 tons was forecast (+ 25% compared with 1969/71).

The demand forecast indicated a rise in the domestic consumption of fresh tomatoes from 17 500 tons (1967/69) to about 20 000 tons in 1977 (+ 13%; see Tables 28 and 20*). Although a much greater increase of almost 60% was assumed for domestic production in the same period, imports of fresh tomatoes are expected, for the reasons already discussed in detail in IV, 2 g (abolition of seasonal import ban), to increase again (1969/71: 3 500 tons; 1977: 6 000 tons) so that the

Table 28 - Supply of apples and tomatoes in Ireland ø 1967/69 and forecasts for 1977

('000 tons)

	ø1967/69	1977	Percentage change ø 1967/69 to 1977	Average annual percentage change ø 1967/69 to 1977
APPLES				
Total production[a]	24.0	14.4	- 40.0	- 5.5
Net imports	19.8	40.4	+104.0	+ 8.2
Consumption	43.8	54.8	+ 25.1	+ 2.5
Degree of self-sufficiency (%)	54.8	26.3	-	-
TOMATOES				
Total production	15.7	25.0	+ 59.2	+ 5.3
Exports	1.8	11.2	-	-
Imports	3.6	6.0	-	-
External trade balance	- 1.8	+ 5.2	-	-
Consumption[b]	17.5	19.8	+ 13.1	+ 1.4
Degree of self-sufficiency (%)	89.7	126.3	-	-

[a] Commercial production of dessert and cooking apples.

[b] Excluding tomato concentrate and tomato juice.

Source: cf. annexed Tables 19* and 20*.

additional production would have to be exported in full (exports 1969/71: 3 200 tons; 1977: 11 200 tons).

6. Estimate of income of Irish farmers from the sale of important products in 1977

Forecasts of the income of Irish farmers from the sale of the products in question can be worked out from the price hypotheses for 1977 and from the forecasts of production (and, to some extent, its utilization). The results of these forecasts were summarized in Table 29. Moreover, a comparison was made for the base period (average for 1967/69) between the income calculated by us retroactively (amounts sold multiplied by market or producer prices, the latter being based on the figures in Table 4) and the official Irish estimates so as to obtain a yardstick for the degree of consistency of our calculations vis-à-vis the official figures. The fact that the Irish Central Statistics Office provides not only the estimates of income but also, on a regular basis, the quantity framework on which the income estimates are based proved very useful to us. As regards the vegetable products, and milk and eggs the component amounts could be checked exactly with the official figures; the remaining discrepancies in the income from the above products between our own calculations and the official statistics are due solely to the price components (discrepancy between the market or producer prices derived from Table 4 and the average prices which are given in the official statistics and which are calculated purely arithmetically). It was not possible to follow a similar procedure in the case of cattle for slaughter since the Irish statistics give only the number of units sold (adjusted so as to eliminate imports of live cattle) as amount components, whereas our calculations were based on the gross domestic production in slaughter weight. In spite of this, our calculations for cattle and pigs correspond well with the official figures. Only in the case of sheep was there a considerable difference which may have been due to the figures on prices, which in the last few years have not been very representative, and also to possible errors

in the conversion of prices from live to slaughter weight (and errors in calculating gross domestic production). The estimate of income from the sale of manufacturing milk requires special explanation. On average, a total of 2 342 000 tons of manufacturing milk was delivered to the processing firms in the period 1967-69, of which approximately 40% was accounted for by whole milk and 60% by sales of cream. The resulting mixed average price was £2.38 per 100 kg (compared with a price of £2.523 per 100 kg assuming a 100% sale of whole milk). We estimated the volume of skimmed milk used as feed on farms as 1 300 000 tons in 1977 and the total amount of manufacturing milk available at 4 681 000 tons. The 1 300 000 tons of skimmed milk corresponds to a whole milk equivalent of 1 530 000 tons. Consequently, in 1977 out of a total of 4 681 000 tons of manufacturing milk 67% (4 681 000 - 1 530 000 = 3 151 000 tons) would be delivered to dairies in the form of whole milk and only 33% (1 530 000 tons) in the form of cream. As Table 4 shows, the mixed manufacturing milk price would, according to our price hypotheses, amount to £5.30 per 100 kg given a 40% proportion of all whole milk in all manufacturing milk sales and to £5.63 per 100 kg given a 100% proportion of whole milk (the difference in price between "manufacturing milk-40%" and "manufacturing milk-100%" in 1977: £0.33 per 100 kg). The price for "manufacturing milk-67%" in 1977 was obtained simply by linear interpolation:

$$£5.30 + \frac{(67 - 40)}{(100 - 40)} \cdot 0.33 = £5.45/100 \text{ kg}.$$

The proportion of income from the sale of the products covered by Table 29 in the total income of Irish farmers was just 90% in the base period - if one uses the official figures. Therefore, the estimate of income from the products covered in 1977 ought to afford a fairly comprehensive picture of the changes in the income situation in Irish agriculture which, according to our forecasts, are to be expected under EEC conditions. For the products concerned we obtained for the period ∅ 1967/69 to 1977 almost a trebling of income from £270 000 000 to almost £800 000 000 (in comparison, during the period covered by the report - ∅ 1958/60 to ∅ 1967/69 - income from the sale of the products in question rose by only 44%). This is principally due to the price rises resulting from the adjustment of Irish prices to the EEC agricultural prices and likewise, to a lesser extent, to the expected expansion in the amounts produced. It should, however, be noted that the forecast increases in the production of a number of important products are to be seen primarily as a reaction to the large price increases. The

outstanding positive aspect of Ireland's accession to the EEC for Irish agriculture is undoubtedly to be found in the fact that under EEC conditions it is precisely the prices of those products in which Irish agriculture has the greatest natural advantages of location and considerable and easily mobilized production reserves, namely beef and milk, which will probably rise the most. In these circumstances it is probable that the present unusually strong dependence of Irish agriculture on cattle farming will in future be considerably increased. According to our forecasts, the proportion of income from the sale of store cattle and cattle for slaughter, and from liquid and manufacturing milk in the total income from the products concerned rose from 62% (£167 000 000) in ø 1967/69 to 83% (£659 000 000) in 1977. In contrast, the estimated changes in income from all other products are of only secondary importance for the income situation of Irish farmers in 1977.

Table 29 - The income of Irish farmers from the sale of important products ø 1967/69 and forecasts[a] for 1977

(£ m)

	ø1967/69	1977	Percentage change ø 1967/60 to 1977 Amount	Price	Income
Wheat - own calculation	11,24	11,18	- 25,5	+ 33,5	- 0,5
- official statistics	(11,33)	-	-	-	-
Barley					
- Barley for malting - own calculation	5,38	7,94	+ 10,2	+ 33,9	+ 47,6
- Fodder barley - own calculation	7,75	18,91	+ 47,7	+ 65,2	+144,0
- Barley - total - own calculation	13,13	26,85	+ 35,0	+ 51,4	+104,5
- official statistics	(12,62)	-	-	-	-
Oats - own calculation	0,93	1,23	- 16,7	+ 58,4	+ 32,3
- official statistics	(0,92)	-	-	-	-
Sugar beet - own calculation	8,22	8,56	+ 2,6	+ 1,4	+ 4,1
- official statistics	(8,19)	-	-	-	-
Potatoes					
- State-tested seed potatoes - own calculation	1,17	1,24	+ 11,1	- 4,2	+ 6,0
- Maincrop ware potatoes - own calculation	8,67	7,76	- 6,6	- 4,1	- 10,5
- Potatoes - total - own calculation	9,84	9,00	- 4,7	- 4,0	- 8,5
- official statistics	(8,44)	-	-	-	-
Beef - own calculation	92,06	366,84	+ 62,2	+145,8	+298,5
- official statistics	(93,31)	-	-	-	-
Mutton - own calculation	16,54	31,44	- 3,4	+ 96,8	+ 90,1
- official statistics	(12,77)	-	-	-	-
Pigmeat - own calculation	32,91	42,34	- 9,5	+ 42,2	+ 28,7
- official statistics	(32,70)	-	-	-	-
Milk					
- Liquid milk - own calculation	18,75	37,44	+ 0,2	+ 99,3	+ 99,7
- official statistics	(18,78)	-	-	-	-
- Manufacturing milk - own calculation	55,74	255,11	+ 99,9	+122,7	+357,7
(whole milk proportion)	40 vH	67 vH	-	±129,07[b]	-
- official statistics	(55,61)	-	-	-	-
Eggs					
- Hen eggs - own calculation	10,08	6,75	- 27,9	- 7,1	- 33,0
- official statistics	(9,34)	-	-	-	-
- Duck eggs - own calculation	0,12	0,07	- 41,2	± 0	- 41,2
- official statistics	(0,12)	-	-	-	-
Total income of Irish farmers[c] - official statistics	(294,4)	-	-	-	-
Income from the products covered - own calculation	269,56	796,81	-	-	+195,6
- official statistics	(264,13)	-	-	-	-
Proportion of the products covered in total income in % (basis - official statistics)	89,7	--	-	-	-

[a] Calculated on the basis of the forecasts of production and use, and on the basis of the producer price hypotheses for 1977. [b] Price increase for manufacturing milk after taking into consideration the different proportion of sales of whole milk in total sales of manufacturing milk (cream and whole milk). [c] Excluding the estimated value of changes in cattle stock.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, 1969, p. 29 et seq. Central Statistics Office, Irish Statistical Bulletin, Dublin, June 1972, p. 79. See also Table 4 and annexed Tables. Own calculations and estimates.

ANNEXES

Table 1* - Supply of wheat in Ireland 1958/59 - 1972/73[a] and estimates for 1977/78

('000 tons undried wheat)

	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1977/78
Area under cultivation ('000 ha)	170	114	146	140	127	94	87	74	53	76	90	82	95	91	65	60
Yield (100 kg/ha)	20.6	32.4	31.7	33.6	34.6	32.0	31.3	31.5	34.9	39.2	45.8	44.3	40.0			45.0
Total production	351	369	469	470	439	301	272	233	185	298	412	363	380			270
Total use on farms[b]	35	50	57	32	36	34	29	47	16	(-5)	23	9	27			10
Total sales:	316	319	412	438	403	267	243	186	169	303	389	354	353			260
as seed	26	47	33	37	25	26	26	14	22	20	30	19	18			18
to the milling industry[c]; classified there as:	290	272	379	401	378	241	217	172	147	283	359	335	335			242
millable wheat	27	272	107	311	162	224	213	108	143	227	359	335	335			218
fodder qualities	263	0	272	90	216	22	4	64	4	56	0	0	0			
of which used:																
as fodder wheat in Ireland	216	0	117	75	125	22	4	70	4	56	0	0	0			24
for export	47	-	155	15	91	-	-	-	-	-	-	-	-			
Proportion of millable wheat in total sales to the milling industry (%)	9.3	100.0	28.2	77.6	42.9	92.9	98.2	62.8	97.3	80.2	100.0	100.0	100.0			90.0
Total exports:	47	.	155	15	91	4	3	4	5	6	6	6	7			
fodder wheat	47	-	155	15	91	-	-	-	-	-	-	-	-			
cakes and biscuits in grain equivalent[g]	.	.	.	.	.	4	3	4	5	6	6	6	7			10
Total imports:	329	283	182	256	192	219	240	288	313	310	178	126	163			
wheat for milling	318	279	179	253	190	214	234	281	307	304	170	114	136			143
wheat seed	11	4	3	3	2	2	1	2	1	1	1	1	1			0
flour and biscuits in grain equivalent[g]	.	.	.	.	.	3	5	5	5	5	7	11	26			10
Total net imports	282	283	27	241	101	215	237	284	308	304	172	120	156			
Total quantities available	633	652	496	711	540	516	509	517	493	602	584	483	536			
Use in the milling industry:																
theoretically available for milling[d]	345	551	286	564	352	438	447	389	450	531	529	449	471			
actually milled[e]	418	418	398	397	392	388	363	358	358	334	340	340	322			286
flour production (product weight)	272	272	259	258	255	252	236	233	233	217	221	221	209			186
(≈flour consumption in product weight)	272	272	259	258	255	251	238	234	233	216	222	226	228			186
per capita consumption of flour (kg)	95.3	95.6	91.5	91.6	90.3	88.3	83.5	81.4	80.8	74.5	76.3	77.3	77.6			61.0
Use as seed[f]	37	51	36	40	27	28	27	16	23	21	31	20	19			18
Use of domestic wheat as fodder wheat	216	0	117	75	125	22	4	70	4	56	92[i]	67[i]	78[i]			99[j]
Statistical errors; feeding of surplus domestic bread wheat up to 1967/68[h]	-73	133	-112	167	-40	50	84	31	92	197	97	42	71			.

[a] Farm years April - March. [b] Mainly feeding on the farm and partly seed produced on the farm. [c] Including sales to wheat dealers. [d] Imports of bread wheat plus the total quantity of domestic wheat classified as millable by the milling industry. [e] Based on an extraction rate of 65% for undried wheat. [f] Only seed bought on the market. [g] Average of two calendar years in each case. [h] Difference between the total quantity of bread wheat available and that actually milled up to 1967/68; from 1968/69; this difference corrected by the amount of bread wheat used de facto as fodder (cf. footnote [i]). [i] Use of surplus millable wheat as fodder. [j] 75 000 t surplus bread wheat and 24 000 t fodder qualities.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, 'Irish Statistical Bulletin', Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Department of Agriculture and Fisheries in the EEC, Dublin, Stationery Office, April 1970. Central Statistics Office, 'Trade Statistics of Ireland', Dublin, Stationery Office, various issues. Department of Agriculture, Report of the Survey Team established by the Minister for Agriculture on the Flour Milling Industry, Dublin, Stationery Office, November 1965. Own calculations and estimates.

Table 2* - Supply of barley in Ireland 1958/59 - 1972/73[k] and estimates for 1977/78

('000 tons grain weight)

	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1972/73	1977/78
Total area under cultivation ('000 ha)	126	134	133	146	165	174	184	188	187	183	184	198	214	235	255	230
Barley for malting ('000 ha)	45	50	48	49	52	49	51	55	55	52	48	47	51	53	57	50
Fodder barley ('000 ha)	81	84	85	97	113	125	133	133	132	131	136	151	163	182	198	180
Yield (100 kg/ha)																
Barley for malting (100 kg/ha)	25.1	32.6	31.7	33.9	35.4	32.7	28.4	31.5	32.2	34.6	39.2	37.4	34.7			40.0
Fodder barley (dz per ha)	27.5	35.2	34.1	36.0	37.1	34.2	30.5	33.3	34.9	37.9	41.5	40.5	37.1			42.0
Total production	336	459	442	515	603	588	551	616	638	676	752	788	782			956
Barley for malting	113	163	152	166	184	160	145	173	177	180	188	176	177			200
Fodder barley	223	296	290	349	419	428	406	443	461	496	564	612	605			756
Total use on farms[a]	168	187	171	176	166	168	145	197	200	217	221	210	182			250
Total sales:	168	272	271	339	437	420	406	419	438	459	531	578	600	725		706
as seed[b]	.	.	.	.	.	.	6	8	9	8	9	10	10			10
as fodder barley at support price to the Grain Marketing Board[c]	.	.	.	.	112	43	0	80	131	101	104	173	75)			696
other barley for fodder and malting[d]	168	272	271	339	325	377	400	331	298	350	418	395	515)			
Total exports:	3	18	30	9	13	81	12	9	10	10	15	15	23	29		
as barley for fodder and malting[e]	2	15	26	2	6	72	0	0	0	1	1	1	1	0		
as malt (in cereal equivalent)	1	3	4	7	7	9	12	9	10	9	14	14	22	29		40
Total imports:	55	18	12	5	4	5	0	80	8	6	51	54	73	182		
as seed	1	12	0	4	3	5	0	0	0	0	0	0	0	6		0
as fodder barley	54	6	12	1	1	0	0	80	8	6	51	54	73	176		
External trade balance	-52	± 0	+10	+ 4	+ 9	+76	+12	-71	+ 2	+ 4	-36	-39	-50	-153		
Total quantity available	388	459	424	511	594	512	539	607	636	672	788	827	832			
Use at home:																
as barley for malting in breweries & malt houses[f]	88	97	100	112	109	104	112	108	114	120	131	140				175
in distilleries[g]	5	5	7	6	7	7	8	8	8	10	10	10				20
for other barley products[g,h]	23	15	23	26	26	30	35	35	30	33	32	35				30
as fodder barley[i]	250	322	273	346	429	349	364	513	463	487	595	620				
as seed[j]	23	23	25	28	30	31	32	32	31	31	34	36	40			39
of which domestic seed	22	11	25	24	27	26	32	32	31	31	34	36	40			39

[a] Mainly for use as fodder on the farm and the bulk of total seed requirements for barley. [b] Only sales under the Seed Certification Scheme. [c] Up to 1962/63 sales to the feedingstuffs industry under the support programme for fodder barley; from 1963/64 sales to the Grain Marketing Board (An Bord Grain). [d] It should be noted that every year a part of the total harvest of barley for malting is used as fodder barley. [e] Almost exclusively fodder barley. [f] Including the quantities of barley used to produce malt for export; operating year October-September for breweries and September-August for malt houses. [g] Calendar years. [h] Assuming that 1 kg barley products corresponds to about 1.5 kg barley as grain. [i] Own estimate; total production of barley less the quantities of barley used in the food industry and in malt houses, breweries and distilleries, less the seed obtained from the domestic harvest and corrected by the external trade balance for fodder barley (= total domestic consumption of fodder barley including barley used as feed on producer farm). [j] Assuming that about 170 kg seed is required for 1 hectare under cultivation. [k] Farm years April to March; external trade; calendar year.

Source: See supply situation statement for wheat.

Table 3* - Supply of other cereals in Ireland 1958/59 - 1971/72[a] and estimates for 1977/78

('000 tons)

	1958/59	1959/60	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1977/78
OATS:															
Area under cultivation ('000 ha)	185	187	172	149	140	134	117	115	98	96	88	77	68	60	45
Yield (100 kg/ha)	24,6	25,8	24,8	25,6	28,3	27,5	26,8	28,2	28,9	30,6	32,5	32,6	30,3		35,0
Total production	456	482	426	381	396	368	313	324	283	294	286	251	206		150
Total use on farms[b]	398	414	361	327	346	289	250	283	245	253	247	206	161		123
Total sales[b]	58	68	65	54	50	79	63	41	38	41	39	45	45	39	35
Total imports:	38	5	21	23	16	13	14	23	22	16	7	7	43	84	
as seed	17	5	15	13	14	10	10	9	10	5	1	1	1	3	0
for the food and animal feedingstuffs industries	21	-	6	10	2	3	4	14	12	11	6	6	42	81	(5)
Total quantity available	494	487	447	404	412	381	327	347	305	310	293	258	249		
Estimated use at home:															
for production of rolled oats[c]	20	20	24	20	20	20	20	18	16	15	16	15	.		15
as feed in the form	429	426	387	350	360	333	279	305	266	274	259	227	.		
of seed[d]	45	41	36	34	32	28	28	24	23	21	18	16	15		11
of which domestic seed	28	36	21	21	18	18	18	15	13	16	17	15	14		11
MAIZE:															
Imports of fodder maise[e]	24	68	140	86	185	84	109	119	122	116	136	125	138	94	
MILOCORN/FOREIGN FODDER WHEAT:															
Imports of milocorn for fodder purposes[e]	0	1	0	1	0	0	88	156	155	111	59	36	70	141	
Licences issued for the import of milocorn and/or fodder wheat (farm years)	.	.	.	.	.	59	149	221	153	102	152	91	101		
BREAKFAST CEREALS:															
Imports[e,f]	.	.	.	.	.	0,4	0,6	0,6	0,9	1,2	1,6	2,3	2,4	3,2	5,0
RICE:															
Imports for human consumption[e]	3	2	3	2	3	2	2	3	2	3	2	3	3	3	3

[a] Farm years April - March. [b] In the official Irish statistics, sales from one farmer to another and purchases by merchants who resell the oats unprocessed to agriculture are defined as oats for "farm use", consequently "total sales" contain sales to the food and animal feedingstuffs industries only. [c] On the basis of production of "flaked and rolled oat meal" and "other oat meal" in the milling industry (data from industrial statistics) and of an extraction rate of 55%. [d] Assuming that on average 240 kg seed is required per hectare of area under cultivation. [e] Calendar years from 1958. [f] Almost exclusively corn flakes.

Source: See supply situation statement for wheat.

Table 4* - Supply of sugar in Ireland 1960/61 - 1971/72[a] and estimates for 1977/78

('000 tons white sugar value)

Farm years	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71	1971/72	1977/78
Area under sugar beet ('000 ha)	28	32	32	36	32	27	22	26	26	25	26	30	26
Yield (tons per ha)	34.0	27.9	29.1	26.4	27.9	28.1	32.0	36.8	42.0	36.6	37.7	40.6	39.0
Beet production	951	892	931	952	893	759	704	956	1093	916	981	1218	1 014
White sugar yield from the respective beet harvest (%)	.	.	13.5	14.0	14.7	14.2	14.6	14.0	13.7	15.1	14.5		15.0
Sugar production from the respective beet harvest	.	.	126.0	133.1	131.1	107.7	102.6	134.1	149.4	137.9	142.4		150.0
Calendar years	**1960**	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1967**	**1968**	**1969**	**1970**	**1971**	**1977**
Sugar production	119.5	136.0	120.9	120.2	140.8	115.5	115.8	122.6	141.9	142.1	153.9		150.0
Total exports	38.7	37.3	46.3	49.2	36.4	40.1	51.6	53.1	52.6	48.0	52.8		
Refined sugar	13.3	11.9	20.9	18.7	8.0	10.6	17.1	15.2	15.2	14.8	17.1	13.7	
Products containing sugar	25.4	25.4	25.4	30.5	28.4	29.5	34.5	37.9	37.4	33.2	35.7		
Total imports	27.7	48.3	55.3	48.3	51.0	54.1	108.9	97.1	60.0	47.1	46.9	68.8	
Raw sugar	25.2	44.5	49.8	42.0	44.3	36.5	91.6	88.7	49.3	32.9	29.2	38.9	
Refined sugar	-	-	-	0.3	2.3	7.6	6.5	0.3	0.3	0.3	1.3	1.4	
Products containing sugar	2.5	3.8	5.5	6.0	4.4	10.0	-10.8	8.1	10.4	13.9	16.4	28.5	
Total external trade balance	+11.0	-11.0	- 9.0	+ 0.9	-14.6	-14.0	-57.3	-44.0	- 7.4	+ 0.9	+ 5.9		- 25.0
Opening stocks	116.8	96.5	105.6	103.7	83.3	92.3	82.7	105.8	123.3	125.4	115.1		
Closing stocks	96.5	105.6	103.7	83.3	92.3	82.7	105.8	123.3	125.4	115.1	107.3		
Total quantity available	128.8	137.9	131.8	139.7	146.4	139.1	150.0	149.1	147.2	151.5	155.8		175.0
Direct consumption	85.5	89.3	77.7	84.4	76.6	82.7	78.4	76.5	79.2	76.6	76.7		67.0
per capita (kg)	30.2	31.7	27.5	29.7	26.9	28.8	27.2	26.4	27.2	26.2	26.1		22.1
Indirect consumption	43.3	48.6	54.1	55.3	69.8	56.4	71.6	72.6	68.0	74.9	79.1		108.0
per capita (kg)	15.3	17.2	19.2	19.5	24.5	19.6	24.8	25.0	23.4	25.6	26.9		35.3
Total per capita consumption (kg)	45.5	48.9	46.7	49.2	51.4	48.4	52.0	51.4	50.6	51.8	53.0		57.4

[a] Farm year April - March.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. International Sugar Organisation, Sugar Yearbook, London, various issues. Own calculations and estimates.

Table 5* - Supply of potatoes in Ireland 1958-72 and estimates for 1977
('000 tons)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1977
Area under cultivation ('000 ha)	106	105	95	86	85	83	74	71	68	65	59	55	57	52	45	35
Yield (tons per ha)	17,7	25,1	19,3	24,9	24,9	23,7	20,6	23,2	24,7	26,9	27,5	26,4	25,8			30,0
Total production	1880,0	2633,0	1829,0	2145,0	2117,0	1969,0	1526,0	1648,0	1678,0	1748,0	1625,0	1453,0	1468,0			1 050,0
Farm consumption:																
seed potatoes produced on the farm	256,2	234,8	206,6	206,0	201,5	178,3	174,7	167,2	160,5	144,6	133,7	139,8	128,2			31,0
fodder potatoes	1152,7	1805,8	1033,9	1423,3	1364,0	1264,7	804,3	1007,8	1038,5	1120,4	988,3	810,2	871,4			496,0
Total sales[a]	471,1	592,4	588,5	515,7	551,5	526,0	547,0	473,0	479,0	483,0	503,0	503,0	468,4	479,6		473,0
State-tested seed potatoes	44,9	51,6	61,0	52,0	39,9	77,0	53,0	42,7	46,1	51,4	57,5	53,2	42,5			60,0
ware and industrial potatoes	426,2	540,8	527,5	463,7	511,6	449,0	494,0	430,3	432,9	431,6	445,5	449,8	437,1			413,0
Total exports	35,1	62,3	56,1	48,2	76,7	74,9	50,0	39,6	49,0	56,6	57,6	52,3	37,8			76,0
State-tested seed potatoes	28,1	39,4	44,0	32,7	39,6	54,0	43,3	33,4	37,7	42,9	50,1	45,5	35,6	40,2		50,0
early potatoes	2,1	1,4	5,1	1,8	8,4	4,6	2,2	2,1	1,9	1,5	1,3	1,7	1,2			1,0
maincrop ware potatoes	4,9	21,5	7,0	13,7	28,7	16,3	4,5	4,1	9,4	12,2	6,2	5,1	1,0			25,0
Total imports	0	0	0	-	0,1	0,8	0,5	0,3	0,1	0,4	7,3	2,4	0,3			0
seed potatoes	0	0	0	-	0,1	0,7	0,2	0,3	0,1	0,3	1,9	0,7	0,1			0
other potatoes	-	-	-	-	-	0,1	0,3	0	0	0,1	5,4	1,7	0,2			0
Net exports	35,1	62,3	56,1	48,2	76,6	74,1	49,5	39,3	48,9	56,2	50,3	49,9	37,5			76,0
Total quantity available	1844,9	2570,7	1772,9	2096,8	2040,4	1894,9	1476,5	1608,7	1629,1	1691,8	1574,7	1403,1	1430,5			974,0
Use in Ireland																
as ware potatoes	430,8	460,8	452,3	438,5	438,0	436,9	430,2	424,9	421,4	416,9	411,8	408,6	402,8			387,0
per capita consumption (kg)	151,0	161,9	159,7	155,6	155,1	153,8	151,0	147,9	146,1	143,8	141,5	139,7	137,0			127,0
for industrial purposes (starch and alcohol)	2,1	72,4	16,5	14,7	14,5	.	26,4	3,1	4,5	5,9	15,8	0,8	2,3			0
as seed potatoes	273,0	247,0	223,6	221,0	215,8	192,4	184,6	176,8	169,0	153,4	143,0	148,2	135,2	117,0		91,0
Statistical errors	-13,7	-15,3	46,6	- 0,7	8,1	0,9	31,0	- 3,9	- 4,3	- 4,8	15,8	35,3	18,8			-

[a] Including farm household consumption for the table.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, "Trade Statistics of Ireland", Dublin, Stationery Office, various issues. FAO, Trade Yearbook, Rome, various issues. Own calculations and estimates.

Table 6* - Supply of beef in Ireland 1958-71 and estimates for 1977

('000 tons slaughter weight)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Gross domestic production.....	208,1	189,1	233,4	275,6	235,9	247,5	253,7	220,2	258,7	331,3	295,7	284,6	293,8		453,0
Meat equivalent of exports of live cattle.....	137,0	104,2	120,9	160,3	124,6	141,0	170,5	129,3	135,4	137,2	129,3	113,9	109,9	127,9	63,1
Net domestic production.....	71,1	84,9	112,5	115,3	111,3	106,5	83,2	90,9	123,3	194,1	166,4	170,7	183,9		429,9
Meat equivalent of imports of live cattle.....	21,2	16,8	10,2	37,4	22,6	31,1	32,6	22,9	16,0	33,9	28,3	28,7	35,0	18,5	7,0
Net production.....	92,3	101,7	122,7	152,7	133,9	137,6	115,8	113,8	139,3	228,0	194,7	199,4	218,9		436,9
Total exports of beef and veal:.....	50,1	60,7	80,5	109,6	88,7	89,0	68,5	68,4	91,4	177,0	142,9	145,9	162,7	173,8	385,1
fresh and chilled	10,5	13,9	18,8	37,4	24,8	27,6	39,5	45,3	44,7	107,4	86,4	87,6	108,6	108,6	
frozen	24,2	32,0	43,7	56,0	52,5	51,0	19,8	14,7	38,1	60,8	46,1	51,3	47,7	59,0	
preserved	15,4	14,8	18,0	16,2	11,4	10,4	9,2	8,4	8,6	8,8	10,4	7,0	6,4	6,2	
Domestic consumption.....	42,2	41,0	42,2	43,1	45,2	48,6	47,3	45,4	47,9	51,0	51,8	53,5	56,2		51,8
Per capita consumption (kg).....	14,8	14,4	14,9	15,3	16,0	17,1	16,6	15,8	16,6	17,6	17,8	18,3	19,1		17,0

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, current issues, Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO, Production Yearbook, Rome, various issues. Department of Agriculture, Report of the Survey Team established by the Minister for Agriculture on the Beef, Mutton and Lamb Industry, Dublin, Stationery Office, April 1963. Own calculations and estimates.

Table 7* - Supply of mutton and lamb in Ireland 1958-71 and estimates for 1977

('000 tons slaughter weight)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Gross domestic production.....	33.3	36.0	40.7	35.6	44.4	44.8	46.3	46.0	49.4	44.8	43.5	42.9	38.0	
Meat equivalent of exports of live sheep.....	3.1	4.2	5.4	5.6	5.7	5.0	4.9	3.9	3.0	2.4	2.7	1.6	1.2	2.2
Net domestic production.....	30.2	31.8	35.3	30.0	38.7	39.8	41.4	42.1	46.4	42.4	40.8	41.3	36.8	
Meat equivalent of imports of live sheep.....	1.9	5.0	4.8	7.3	8.2	7.9	5.1	2.6	2.2	2.9	3.3	2.5	2.9	3.8
Net production.....	32.1	36.8	40.1	37.3	46.9	47.7	46.5	44.7	48.6	45.3	44.1	43.8	39.7	
Exports of mutton and lamb - total.....	6.7	6.9	9.8	7.4	15.3	15.6	14.9	14.2	17.5	13.4	12.7	11.3	7.9	14.1
Domestic consumption.....	25.4	29.9	30.3	29.9	31.6	32.1	31.6	30.5	31.1	31.9	31.4	32.5	31.8	
Per capita consumption (kg).....	8.9	10.5	10.7	10.6	11.2	11.3	11.1	10.6	10.8	11.0	10.8	11.1	10.8	

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO, Production Yearbook, Rome, various issues. Own calculations estimates.

Table 8* - Supply of pork and bacon in Ireland ('000 kg slaughter weight) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977[1]
Total gross domestic production	100.2	87.2	95.6	106.4	113.1	115.4	120.3	136.8	123.7	108.8	122.3	140.3	140.8		112.0
Meat equivalent of exports of live pigs	0	0.1	0.7	0.2	0.3	0.2	0.4	0.4	0.1	0.4	0.1	0.1	0.1	0.1	0
Total net domestic production	100.2	87.1	94.9	106.2	112.8	115.2	119.9	136.4	123.6	108.4	122.2	140.2	140.7		112.0
Meat equivalent of imports of live pigs	0.3	0.6	0.3	0.2	0.1	0.6	1.4	2.1	1.9	0.8	0.9	0.9	1.2	1.1	0
Total net production[a,c]	100.5	87.7	95.2	106.4	112.9	115.8	121.3	138.5	125.5	109.2	123.1	141.1	141.9		112.0
Bacon	.	71.8	77.9	86.4	85.3	86.7	91.3	94.6	96.4	88.3	96.7	98.4	105.1		87.4
Pork[b]	.	15.9	17.3	20.0	27.6	29.1	30.0	43.9	29.1	20.9	26.4	42.7	36.8		24.6
Exports of bacon[a] and pork - total	42.0	27.7	33.8	42.2	45.8	47.7	46.9	58.4	47.9	35.7	48.9	60.6	54.7		14.2
Bacon and ham	39.6	26.1	31.3	38.9	35.6	35.9	38.1	37.5	38.6	32.4	38.9	38.1	37.7	36.7	10.0
Pork	0.9	0.6	1.6	3.0	9.9	11.5	8.6	20.7	9.0	3.0	9.3	22.2	16.6	25.2	4.2
Pork sausages[d]	1.2	0.8	0.5	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.5	0.1	0.1		0
Tinned ham[e]	0.3	0.2	0.2	0	0	0	0	0	0	0	0.2	0.2	0.3		0
Total domestic consumption	58.5	60.0	61.4	64.2	67.1	68.1	74.4	80.1	77..	73.5	74.2	80.5	87.2		104.8
Bacon	.	45.5	46.4	47.5	49.7	50.8	53.2	57.1	57.8	55.9	57.6	60.1	67.1		80.4
Pork	.	14.5	15.0	16.7	17.4	17.3	21.2	23.0	19.8	17.6	16.6	20.4	20.1		24.4
Total per capita consumption (kg)	20.5	21.1	21.7	22.8	23.8	24.0	26.1	27.9	26.9	25.4	25.5	27.5	29.7		34.4
Bacon	.	16.0	16.4	16.9	17.6	17.9	18.7	19.9	20.0	19.3	19.8	20.5	22.8		26.4
Pork	.	5.1	5.3	5.9	6.2	6.1	7.4	8.0	6.9	6.1	5.7	7.0	6.9		8.0

[a] Assuming that 1 kg bacon in product weight corresponds to about 1.35 kg bacon in slaughter weight. [b] Fresh pork, preserved pigmeat and pork sausages. [c] Including ham. [d] 1 kg pork sausages corresponds to 1 kg pork in slaughter weight. [e] 1 kg tinned ham = 1 kg ham in slaughter weight. [1] Assumption on imports of pork in 1977: 4.0 (bacon 3.0).

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Pigs and Bacon Commission, Report of Proceedings and Statement of Accounts for the year ended ..... Dublin, issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO, Production Yearbook, Rome, various issues. Own calculations and estimates.

Table 9* - Supply of edible offals in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Total domestic production[a]	27.0	27.3	31.2	25.6	35.5	36.4	34.2	35.6	37.8	46.2	43.5	46.0	47.9		71.2
from cattle[b]	11.1	12.2	14.7	18.3	16.1	16.5	13.9	13.7	16.7	27.4	23.4	23.9	26.3		52.4
from sheep[c]	4.8	5.5	6.0	5.6	7.0	7.2	7.0	6.7	7.3	6.8	6.6	6.6	6.0		6.5
from pigs[d]	11.1	9.6	10.5	11.7	12.4	12.7	13.3	15.2	13.8	12.0	13.5	15.5	15.6		12.3
Total exports	3.9	3.9	5.0	5.6	5.7	8.2	8.6	8.2	9.3	12.7	10.5	10.6	12.4	12.4	35.3
Total domestic consumption	23.1	23.4	26.2	30.0	29.8	28.2	25.6	27.4	28.5	33.5	33.0	35.4	35.5		35.9
Per capita consumption (kg)	8.1	8.2	9.3	10.6	10.6	9.9	9.0	9.5	9.9	11.6	11.3	12.1	12.1		11.8

[a]Own estimate. [b]12% of net production of beef. [c]15% of net production of mutton and lamb. [d]11% of total net production. of pigmeat.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Pigs and Bacon Commission, Report of Proceedings and Statement of Accounts for the year ended ..., Dublin, various issues. FAO, Production Yearbook, Rome, various issues. Own calculations and estimates.

Table 10* - Production and disposals of whole milk in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Stock of dairy cows ('000)	1260	1272	1284	1291	1309	1323	1400	1547	1582	1568	1607	1657	1713	1782	2700
Average milk yield (kg)	2079	1955	2072	2148	2190	2181	2141	2027	2039	2203	2280	2219	2140	2095	2300
Total milk production	2620	2487	2661	2773	2867	2886	2998	3135	3226	3455	3664	3677	3665	3734	6210
Own consumption by producers:	758	757	755	743	754	708	693	684	675	649	634	619	622	641	905
as feed	412	416	420	422	428	433	458	506	518	513	526	542	556	583	905
for farm butter production	346	341	335	321	326	275	235	178	157	136	108	77	66	58	0
Milk deliveries to creameries and to processing industry	1862	1730	1906	2030	2113	2178	2305	2451	2551	2806	3030	3058	3043	3093	5305
Liquid milk[a]	574	584	595	605	605	608	614	622	621	625	621	622	625	630	624
Cream	30	33	32	33	37	40	42	43	49	46	59	72	120[b]	100[b]	73
Creamery butter	1111	932	1086	1155	1181	1172	1293	1371	1458	1596	1754	1775	1665	1732	3650
Cheese	23	29	48	59	77	107	143	160	176	247	289	277	284	333	475
Whole milk powder	14	19	23	58	79	125	82	110	76	84	104	114	157	105	235
Chocolate crumb	100	114	111	113	125	117	121	136	151	180	164	142	136	140	133
Other	10	9	11	7	9	9	10	9	20	28	39	56	56	53	115

[a] Including liquid milk consumption of producer farms. [b] Own calculations based mainly on the exports of cream given in external trade statistics in product weight.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Own calculations and estimates.

Table 11* - Supply of butter in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Total production	55.5	47,8	58.4	60,9	62.2	60.3	64,2	65,4	67,0	73.0	77,3	78.2	73.2	75.6	155.0
Farm butter	11,8	11,6	12,4	11.9	12,1	10.2	8,7	6.6	5.8	5.0	4.0	2,8	2,4	2.1	0
Creamery butter	43,7	36.2	46,0	49.0	50,1	50.1	55.5	58.8	61.2	68.0	73.3	75.4	70.8	73,5	155.0
Total exports	16.7	7.9	7.6	15.4	16,3	19.5	18,3	20,5	23.7	28.4	37.8	42,5	45.8	32,2	124.5
Farm butter	0.4	0,6	0.6	0.4	0,4	0,3	0.4	0,3	0.4	0.4	0.4	0.4	0.4	0.5	0
Creamery butter	16.3	7,3	7.0	15.0	15,9	19.2	17.9	20,2	23.3	28.0	37.4	42.1	45.4	31.7	124.5
Imports	-	0	-	0	0,1	0	0	0	0.1	0	0	0	0	0	0
Export surplus	16.7	7.9	7.6	15.4	16,2	19.5	18.3	20.5	23.6	28.4	37.8	42.5	45.8	32,2	124.5
Opening stocks	12,5	8.9	10,3	14,8	15,1	15,2	10,3	10,8	11.5	14,2	19,1	20.4	18.7	7.4	
Closing stocks	8,9	10,3	14,8	15,1	15,2	10.3	10,8	11,5	14.2	19,1	20,4	18.7	7,4	11,4	
Total consumption	46.8	49,0	45,9	44.8	45,5	45,2	44,7	43,7	41,0	39,1	38,4	36,0	36,5		30,5
Per capita consumption (kg)	16,4	17,2	16,2	15,9	16,1	15,9	15,7	15,2	14,2	13,5	13,2	12,3	12,4		10.0
Statistical errors	-4.4	-10,5	-0,4	0.4	0.4	0.5	0,7	0,5	-0.3	0,6	-0,2	1.4	2.2		

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Central Statistics Office, Trade Statistics of Ireland Dublin, Stationery Office, various issues. Own calculations and estimates.

Table 12* - Supply of cheese in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Production	2,5	4,2	5,5	7,1	7,9	9,7	14,9	16,8	17,3	25,0	28,2	27,1	27,8	33,0	46,6
Exports	0,2	0,7	0,7	2,3	4,4	6,9	9,8	10,0	13,6	17,6	21,8	19,7	24,0	28,2	40,0
Imports	0,1	0,2	0,1	0,1	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,4	0,2	0,4	1,0
Export surplus	0,1	0,5	0,6	2,2	4,2	6,7	9,6	9,8	13,4	17,4	21,6	19,3	23,8	27,8	39,0
Opening stocks	.	.	.	1,5	2,5	2,7	3,0	4,1	6,3	6,5	8,2	10,3	12,4		
Closing stocks	.	.	1,5	2,5	2,7	3,0	4,1	6,3	6,5	8,2	10,3	12,4	11,0		
Total consumption	2,9	3,4	3,5	3,8	4,1	4,6	4,8	5,1	5,3	5,8	6,1	6,9	6,5		7,6
Per capita consumption (kg)	0,91	1,18	1,22	1,35	1,45	1,61	1,68	1,77	1,85	2,01	2,11	2,35	2,20		2,50
Statistical errors	-0,5	0,3	1,4	-0,1	-0,6	-1,9	-0,6	-0,3	-1,6	0,1	-1,6	-1,2	-1,1		

Source: See Table 13*.

Table 13* - Supply of milk powder in Ireland ('000 tons) 1960-71 and estimates for 1977

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Whole milk powder													
Production	2,5	6,8	9,3	15,1	10,2	13,4	9,2	9,7	12,2	14,3	17,9	12,8	27,6
Exports	2,0	4,8	6,9	12,1	10,5	10,2	8,6	8,0	8,8	12,8	12,8	10,6	20,0
Opening stocks	.	.	.	.	.	.	.	.	0,1	0,1	0,4		
Closing stocks	.	.	.	.	.	.	.	0,1	0,1	0,4	0,2		
Domestic consumption	1,0	1,0	1,0	2,0	1,0	1,0	2,0	3,0	1,0	3,0	6,1		7,6
Per capita consumption(kg)	0,35	0,35	0,35	0,70	0,35	0,35	0,69	1,03	0,34	1,03	2,07		2,50
Skimmed milk powder													
Production	8,6	5,8	5,1	3,8	9,8	10,7	24,7	31,1	28,7	37,9	34,2	48,0	140,0
Exports	4,4	6,2	3,2	1,4	6,4	5,9	14,0	21,7	26,2	23,8	25,4	32,1	123,0
Domestic consumption[a]	4,1	4,1	2,0	3,0	3,0	4,1	4,1	5,1	5,1	13,2	8,1	15,9	17,0

[a] Used almost exclusively as feed.

Source: Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. Department of Agriculture, Report of the Survey Team established by the Minister for Agriculture on the Dairy Products Industry, Dublin, Stationery Office, February 1963. Own calculations and estimates.

Table 14* - Supply of chocolate crumb in Ireland ('000 tons) 1960-71 and estimates for 1977

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Production	38.7	40.9	47.8	46.4	48.7	45.5	56.0	63.5	61.4	52.7			49.3
Exports	36.7	37.2	40.9	39.2	39.2	38.8	47.4	51.4	48.3	40.8	43.1	41.1	31.0
Available for domestic consumption[a]	2.0	3.7	6.9	7.2	9.5	6.7	8.6	12.1	13.1	11.9			18.3
Estimated domestic consumption	3.5	4.2	4.9	5.5	8.5	9.4	10.0	10.7	13.0	12.0			18.3
Per capita consumption(kg)	1.24	1.49	1.74	1.94	2.98	3.27	3.47	3.69	4.47	4.10			6.00

[a] Production less exports and without regard to changes in stocks on which no reliable information is available.

Source: Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. Department of Agriculture, Report of the Survey Team established by the Minister for Agriculture on the Dairy Products Industry Dublin, Stationery Office, February 1963. Own calculations and estimates.

Table 15* - Supply of cream in Ireland 1958-71 and estimates for 1977

('000 tons whole milk equivalent)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Production	32.0	33.0	37.0	40.0	42.0	43.0	49.0	46.0	59.0	72.0	120.0	100.0	73.3
Total exports:	21.0	21.0	23.8	29.0	27.3	28.0	31.5	34.4	40.5	55.0	105.7	83.9	55.0
as fresh cream[a]	21.0	21.0	23.8	28.0	26.6	26.6	29.4	28.0	29.4	35.0	65.8	63.0	0
as tinned cream[a]	0	0	0	0	0.7	1.4	2.1	1.4	2.1	7.0	4.9	4.9	35.0
other cream[a]	0	0	0	1.0	0	0	0	5.0	9.0	13.0	35.0	16.0	20.0
Available for domestic consumption[b]	11.0	12.0	13.2	11.0	14.7	15.0	17.5	11.6	18.5	17.0	14.3	16.1	18.3
Estimated domestic consumption	11.0	12.0	13.2	12.5	13.2	15.0	15.0	14.1	16.0	17.0	16.8	16.5	18.3
Per capita consumption (kg)	3.88	4.26	4.67	4.40	4.63	5.22	5.20	4.86	5.50	5.81	5.71	5.58	6.00

[a] Assuming that 1 kg tinned cream ≈ 7 kg whole milk, 1 kg fresh cream ≈ 14 kg whole milk and 1 kg "other cream" ≈ 10 kg whole milk. [b] Production less total exports.

Source: See supply situation statement for milk powder.

Table 16* - Supplies and disposals of skimmed milk in Ireland 1960-70 and estimates for 1977

('000 tons)

	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Total skimmed milk:	1238	1286	1315	1267	1338	1356	1418	1515	1637	1640	1581	1612	3165
from butter production[a]	1208	1255	1281	1230	1299	1316	1372	1473	1583	1574	1471	1521	3100
on farms[a]	285	273	277	234	200	151	133	116	92	65	56	49	0
in creameries[a]	923	982	1004	996	1099	1165	1239	1357	1491	1509	1415	1472	3100
from cream production[b]	30	31	34	37	39	40	46	42	54	66	110	91	65
Disposals of skimmed milk:													
in creameries and other processing factories-total	166	134	126	111	180	199	347	421	389	496	455		1865
for production of skimmed milk powder[c]	99	67	59	44	113	123	284	358	330	436	393	552	1605
for fresh consumption[d]	67	67	67	67	67	76	63	63	59	59	59		60
for condensed milk production[e]	-	-	-	-	-		-	0	0	1	3		0
for casein production	-	-	-	-	-	-	-	-	-	-	-	-	200
as liquid feed on farms[f]	1072	1152	1189	1156	1158	1157	1071	1094	1248	1144	1126		1300

[a] Assuming that the skimmed milk obtained amounts to about 85% of the whole milk used for butter production. [b] Only in creameries; it is assumed that the skimmed milk amounts to 92.9% (90%, 85.7%) of the whole milk used in the production of fresh cream ("other cream", tinned cream). [c] About 11.5 kg of skimmed milk are needed to produce 1 kg skimmed milk powder. [d] 90% of the sales of buttermilk and skimmed milk. [e] Rough estimate. [f] It must be borne in mind that butter production in creameries is based largely on the supply of cream.

Source: See supply situation statement for milk powder.

Table 17* - Supply of eggs in Ireland (million dozen) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Number of hens ('000)[a]	6552	6371	6017	5934	5728	5723	5572	5537	5466	5229	4986	4873	5055	4924	3400
Laying capacity (eggs)	137	139	140	141	142	143	144	145	146	146	147	149	144	148	157
Production of hen eggs[b]	74.68	73.84	70.18	69.63	67.93	68.33	66.71	67.00	66.71	63.68	61.09	60.39	60.67	60.68	44.48
Eggs for hatching and wastage	2.53	2.50	2.37	2.35	2.30	2.31	2.26	2.27	2.26	2.15	2.07	2.04	2.05	2.05	1.50
Sales of hen eggs[c]	72.15	71.34	67.81	67.28	65.63	66.02	64.45	64.73	64.45	61.53	59.02	58.35	58.62	58.63	42.98
Sales of duck eggs	2.38	2.75	1.99	1.90	1.60	1.49	1.48	1.33	1.09	0.96	0.85	0.73	0.68	0.60	0.50
Total exports:	1.50	0.70	0.86	1.74	0.18	0.85	0.23	0.13	0.17	0.42	0.29	0.19	0.12	0.30	
Shell eggs[d]	1.27	0.48	0.54	1.11	0.14	0.82	0.20	0.13	0.17	0.42	0.29	0.19	0.12	0.30	
Egg products in shell egg equivalent[e]	0.23	0.22	0.32	0.63	0.04	0.03	0.03	0	0	-	-	-	-	-	
Total imports:	0.02	0	0.11	0.02	0.03	0.28	0.11	0.21	0.52	0.65	1.36	0.89	0.49		
Shell eggs	0.02	-	0.03	0.02	0.01	0.09	0.11	0.04	0.06	0.09	0.05	0	-		
Egg products in shell egg equivalent[e]	0	0	0.08	0	0.02	0.19	-	0.17	0.44	0.56	1.31	0.89	0.49		
External trade balance	+1.48	+0.70	+0.75	+1.72	+0.15	+0.57	+0.01	-0.08	-0.35	-0.23	-1.07	-0.70	-0.37		- 6.51
Direct consumption	69.66	69.49	65.14	63.64	63.30	62.03	61.25	62.25	60.56	57.98	55.29	54.84	52.92		43.65
Direct per capita consumption (eggs)	293	293	276	271	269	262	258	260	252	240	228	225	216		172
Indirect consumption[f]	3.89	3.90	3.91	3.82	3.78	4.91	4.67	3.89	5.33	4.74	5.65	4.94	6.75		6.34
Indirect per capita consumption (eggs)	16	16	17	16	16	21	20	16	22	20	23	20	28		25

[a] No information on the number of laying hens is available, and so the number of hens aged six months and over was taken instead. [b] Own estimate: 103.5% of the sales of hen eggs. [c] Including producers' own consumption for eating. [d] Including eggs for hatching. [e] 1 kg egg products ≈ 30 eggs. [f] Own estimate: sales of hen and duck eggs ± external trade balance and less direct consumption; this item also contains all statistical errors.

Source: Central Statistics Office, Statistical Abstract of Ireland, Dublin, Stationery Office, various issues. Central Statistics Office, Irish Statistical Bulletin, Dublin, various issues. Department of Agriculture and Fisheries, Annual Report of the Minister for Agriculture and Fisheries, Dublin, Stationery Office, various issues. Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO, Production Yearbook, Rome, various issues. FAO, Trade Yearbook, Rome, various issues. Own calculations and estimates.

Table 18* - Supply of poultrymeat in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Domestic production-total	19,1	19.0	17.5	17,4	17.0	18.6	20,2	21,4	24,8	24,8	28,5	30.5	29.9		40.0
Exports	5.2	4,7	3.0	2,7	2,2	1,2	0,3	0,4	0,3	0,5	0,6	0,5	0,5	1,2	
Imports	-	-	-	-	-	-	0	0,1	0	0	0	0	0		
Net exports	5.2	4,7	3,0	2,7	2,2	1,2	0,8	0,3	0,3	0,5	0,6	0,5	0,5		- 2,3
Domestic consumption	13,7	13,9	14,2	14,7	15,0	17,3	19,4	21,0	24,5	24,4	27,9	30,1	29,4		42,3
Per capita consumption(kg)	4,8	4,9	5,0	5,2	5,3	6,1	6,8	7,3	8,5	8,4	9,6	10,3	10,0		13,9
Statistical errors.	0,2	0,4	0,3	-	-0,2	0,1	-	0,1	-	-0,1	-	-0,1	0		-

Source: See Table 17*

Table 19* - Supply of apples in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Area under cultivation (ha)	.	3278	.	.	.	.	.	2954	.	.	.	.	2226		1600
Yield (tons per ha)	.	9,15	.	.	.	.	.	8,46	.	.	.	.	.		9,00
Total production:	15,0	30,0	25,0	9,0	31,0	35,0	24,0	25,0	20,0	20,0	25,0	27,0	.		14,4
- commercial production of dessert apples[a]	.	.	.	.	.	.	.	.	2,5	2,9	5,5	6,3	9,1	7,3	
- commercial production of cooking apples[a]	.	.	.	.	.	.	.	.	6,6	6,6	7,4	6,9	9,7	5,7	
Exports of dessert and cooking apples	0,1	0	0	0	0,1	0,1	-	-	-	0	0,2	0,2	0,1		0
Exports of preserved apples	.	.	0,1	0,2	0	0	0	0	0	-	-	0	0,1		0
Imports of dessert and cooking apples	8,2	11,5	9,2	9,1	10,2	12,6	15,7	17,4	20,4	20,9	17,9	21,1	21,0	20,0	40,4
Net imports of dessert and cooking apples	8,1	11,5	9,2	9,1	10,1	12,5	15,7	17,4	20,4	20,9	17,7	20,9	20,9		40,4
Estimated domestic consumption of dessert and cooking apples	23,1	41,5	34,2	18,1	41,1	47,5	39,7	42,4	40,4	40,9	42,7	47,9			54,8
Per capita consumption (kg)	8,1	14,6	12,1	6,4	14,6	16,7	13,9	14,8	14,0	14,1	14,7	16,4			18,0

[a]Information on imports of preserved apples is not available.

Source: Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues. FAO, Production Yearbook, Rome, various issues. Commonwealth Secretariat, Fruit, A Review, London, various issues. Own calculations and estimates.

Table 20* - Supply of tomatoes in Ireland ('000 tons) 1958-71 and estimates for 1977

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1977
Total tomato-growing area under glass (hectares)	.	55.6	82.6	100.0	108.7	91.2	100.5	110.2	122.2	134.5	156.3	166.3			
- heated (ha)	.	20.8	28.3	32.3	43.3	38.6	46.2	50.8	56.5	68.9	85.2	94.9			
- unheated (ha)	.	34.8	54.3	67.7	65.4	52.6	54.3	59.4	65.7	65.6	71.1	71.4			
Total production of tomatoes	6.0	9.0	10.0	11.0	13.0	10.0	13.0	11.0	14.0	14.0	16.0	17.0			25.0
Exports of fresh tomatoes	.	.	0.4	0.5	0.5	0.7	0.8	0.9	0.9	1.0	2.0	2.4	3.4	3.9	11.2
Imports of fresh tomatoes	5.2	5.3	5.1	4.6	4.7	4.6	4.9	4.2	3.4	3.7	3.4	3.6	3.5	3.4	6.0
External trade balance for fresh tomatoes	.	. .	-4.7	-4.1	-4.2	-3.9	-4.1	-3.3	-2.5	-2.7	-1.4	-1.2	-0.1	+0.5	+ 5.2
Estimated domestic consumption of fresh tomatoes[a]	.	.	14.7	15.1	17.2	13.9	17.1	14.3	16.5	16.7	17.4	18.2			19.8
Per capita consumption (kg)	.	.	5.2	5.4	6.1	4.9	6.0	5.0	5.7	5.8	6.0	6.2			6.5

[a]Accurate information on imports and on domestic consumption of processed products based on tomatoes is not available; however, it is estimated that in recent years the following amounts have been imported annually: about 150 tons of tomato powder (1500 tons fresh tomato equivalent), 250 tons of peeled tomatoes in tins and in jars (300 tons fresh tomato equivalent) and 650 tons other tomato concentrates (paste, etc.) (3900 tons fresh tomato equivalent).

Source: Central Statistics Office, Trade Statistics of Ireland, Dublin, Stationery Office, various issues; FAO, Production Yearbook, Rome, various issues. An Foras Talúntais, The Irish Tomato Industry, Dublin, December 1970. Own calculations and estimates.